A Novel Approach to Communicate with Deaf Dumb and Blind Person

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Abstract— *In day to day life communication is major issue for deaf, dumb people and for Blind person it is difficult to take notes of particular things. So, for removing the barrier of communication a glove is designed for mute people with preloaded messages and a Braille embosser for Blind person to read notes in Braille language.*

The main objective of this paper is to design a portable and reasonably sized Device that is easy to use. The design for this Device was made keeping in mind all different kind of disabilities. This paper is valuable to a disable person who is having difficulty in communicating with others. The hardware implemented in this paper can be used remotely to give notes to blind by imprinting on Braille Embosser. To implement this paper the main components are PIC18F886, APR33A3, Bluetooth Transceiver HC-05, Flex Sensor, Servo motors SG-90.

Keywords— Bluetooth, Braille Embosser, Glove, LCD, PIC.

I. INTRODUCTION

In real word, there are many people who are deaf and dumb cannot communicate easily. Hence in this paper a glove is designed using flex sensor to communicate between Dumb and normal people and assigning particular message for each gesture .The gestures created by the glove will be sent to normal person's phone and will also be displayed on LCD. In this paper a Braille Embosser is designed to communicate with blind person having servomotors to imprint Braille characters with the advancement in the technology, there have been many innovations in regards with this disabled people but person with moderate income would not afford it. So the first and the foremost need of a society is to develop a system through which a person with disabilities can live a life that a normal person does.

Disabilities like blind, deaf, dumb are more of serious concern. Science and Technology have made Human life addictive to comfort but still there exists an underprivileged group of people who are fighting for finding a innovative way that can make the process of communication easier for them. According to the World Health Organization, about 285 million people in the world are blind, 300 million are deaf and 1 million are dumb. In day to day life communication is major issue for deaf, dumb, blind people. This paper "A Novel Approach to Communicate with Deaf, Dumb and Blind Person**"** removes the barrier of communication between them and normal person.

II. SYSTEM FUNCTIONALITY

2.1 PART I: FOR BLIND

First, For Blind people it is very difficult to talk notes and read books like others .This paper developed and designed a Braille Embosser for blind by which the blind will be able to read the alphabets one by one with the help of Braille characters which are in 2*3 Matrix .The input to the Braille embosser can be given remotely using any device using Bluetooth connectivity. In this paper Servo Motors (SG-90) is used for imprinting the Braille characters in 2*3 matrixes. as shown in the fig1.Initially all the pointers of the Servo's are in parallel to the surface of the ground and when some character is being made the shaft is pointed at 90 degrees i.e. perpendicular to the ground surface. Different characters are imprinted with proper delay between each character .In this way we can provide all the reading material to the blind people in Braille Language remotely. For Wireless connectivity Bluetooth Transceiver HC-05 is used.

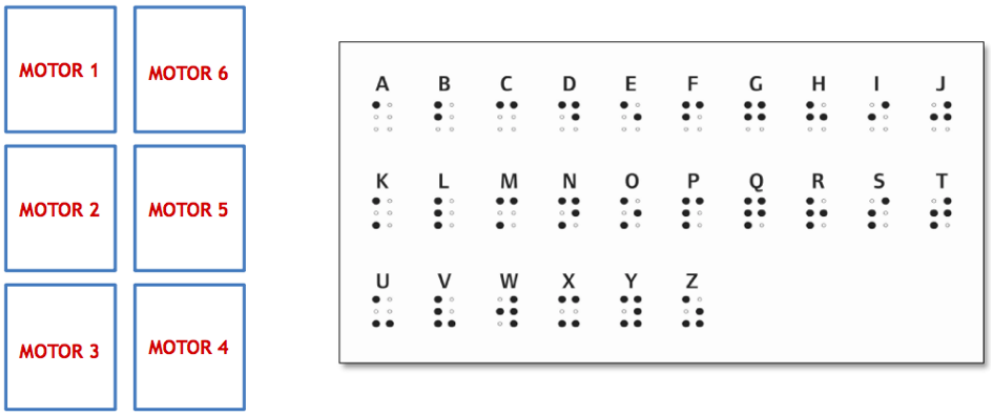

FIG. 1: ARRANGEMENT OF SERVO MOTORS (SG-90) FOR IMPRINTING THE BRAILLE CHARACTERS

2.2 PART II: FOR DUMB

For Mute/Dumb Person input is given through Glove which is having Flex Sensor is shown in fig.2 which is connected to PIC .Output of the glove is computed according to the gesture and a specific preloaded audio clip/message is played via speaker and for this Apr33A3 is used. This output is also sent to the Mobile Device using the Bluetooth Module wirelessly and is displayed on a LCD screen too. For different flex different resistance values were tested at Normal position and at Bend Position and accordingly the program was written using conditions. Like this the different hand gestures were recognized. The Analog to Digital Convertors i.e. ADC are inbuilt in PIC Hence it is not used externally

2.3 PART III : FOR DEAF

Finally, For Deaf Person if we want to convey something to the Deaf person. Input is given via Bluetooth Device Such as Mobile .Which has preloaded messages which can be displayed in front of the LCD screen remotely which lies in front of the Deaf Person.

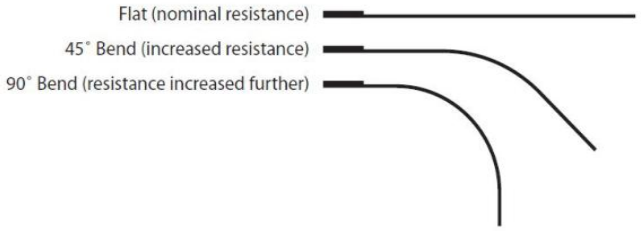

FIG. 2: BENDING OF FLEX SENSOR

III. WORKING PRINCIPLE

For blind people input is given remotely through Mobile device which is connected via Bluetooth and Output can be sensed via braille embosser. Servo Motors SG90 is being used as a Braille Embosser to give the sense of the Braille characters which are in the form of 2*3 Matrix. Bluetooth Transceiver HC-05is used to communicate with the Embosser via PIC16F886.Then, For Mute/Dumb person. Input is given through Glove which is having Flex Sensor which is connected to PIC. Output of Glove is computed according to the gesture specific preloaded audio clip/message is played via speaker and for that APR33A3 module is used. This output is sent through the mobile device using the Bluetooth module wirelessly and is displayed on the LCD screen as shown in fig.3. For different flex resistance values were tested at Normal position and at Bend Position and accordingly the program was written using condition. Then Finally for Deaf person if we want to convey something to the deaf person. Input is given via Bluetooth device such as mobile which has pre loaded messages which can be displayed on LCD screen remotely which lies in front of the deaf person.

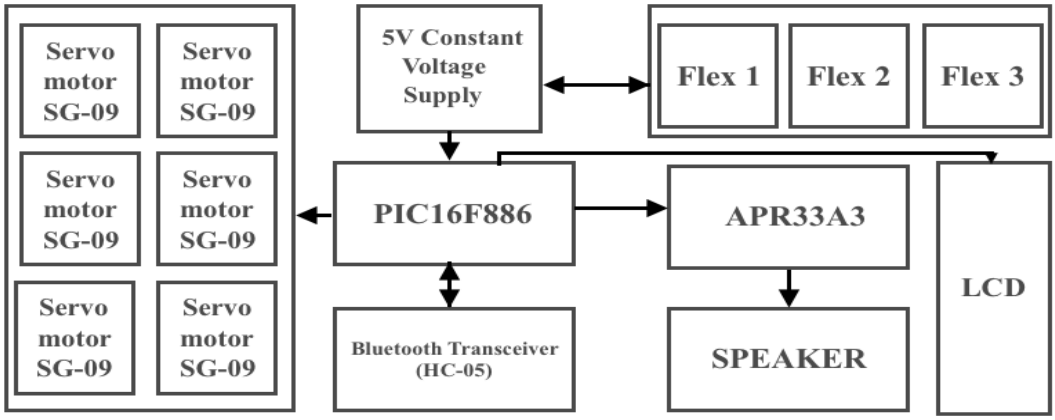

FIG. 3: BLOCK DIAGRAM FOR COMMUNICATION

Fig. 4 circuit diagram used for implementation of hardware part consist of six servo motors arranged in a fashion to imprint braille characters ,which are then connected to PIC at PORTC0-5 , LCD is also connected to PORTB 2-7 of PIC ,Three flex sensor for the gloves are also connected in this diagram to PORTA 0-2 of PIC ,Bluetooth module for wireless communication is connect to PORTC6-7 Audio Playback module is connected to PORT3-7.Pull down Transformer is also connected for prevention the circuit from voltage overloading.

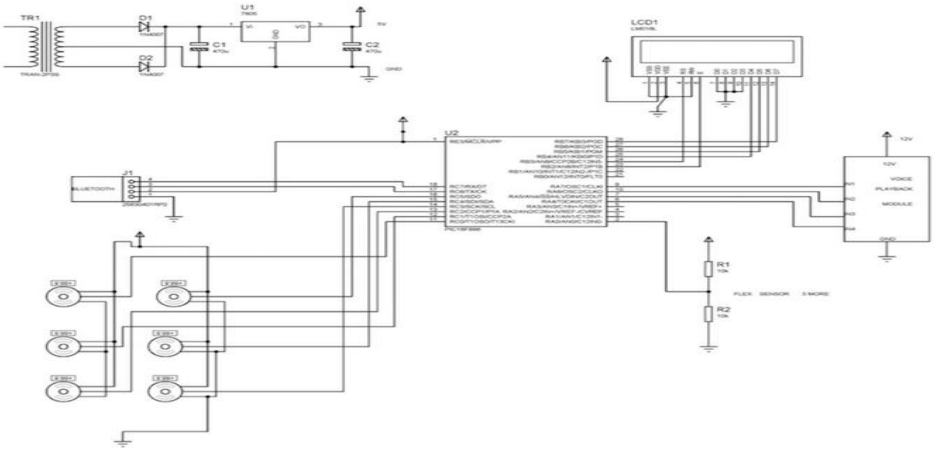

FIG. 4: CIRCUIT DIAGRAM USED FOR IMPLEMENTATION OF HARDWARE

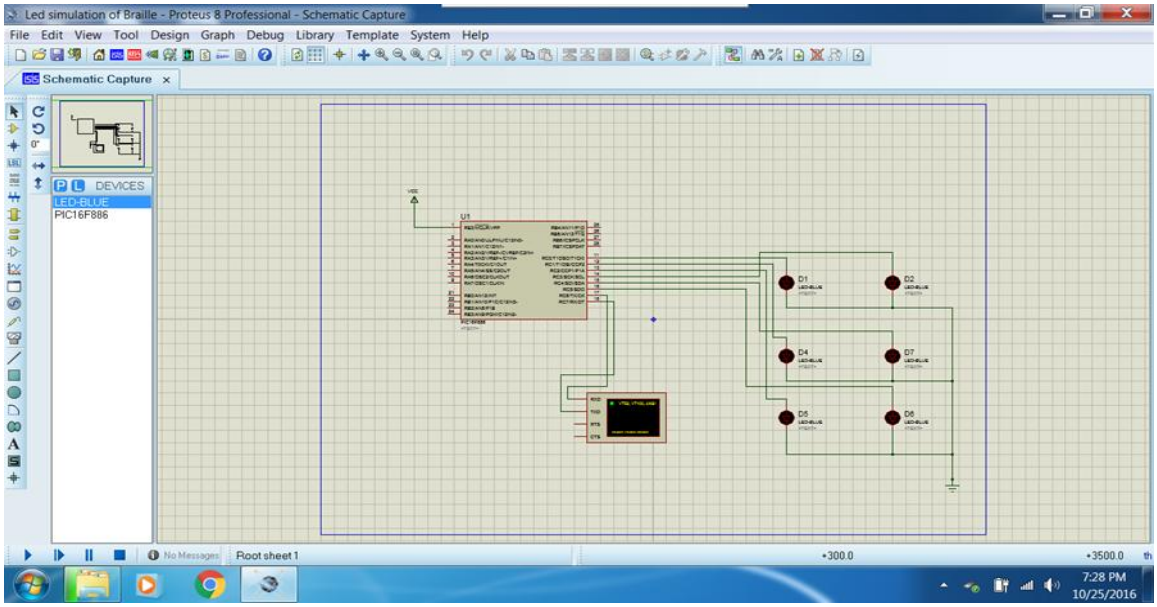

FIG. 5: SIMULATION RESULT

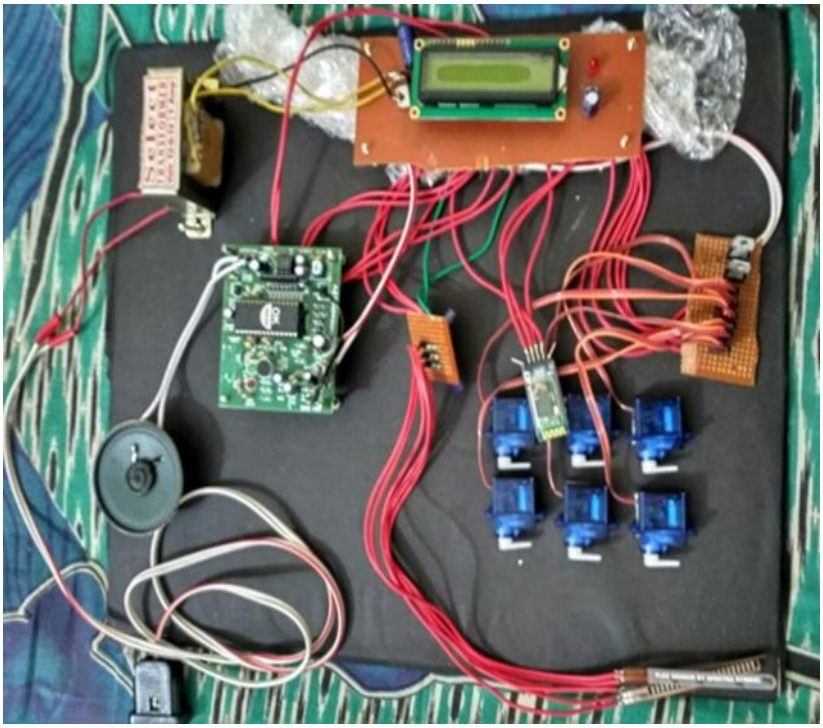

FIG. 6: HARDWARE IMPLEMENTED FOR COMMUNICATION WITH DEAF, DUMB AND BLIND PERSON

IV. CONCLUSION

After working on this noble idea this paper successfully build a device to remove the barrier of communication between deaf, dumb and blind person and a disable person .People can use Bluetooth device for the communication whose range is descent for now i.e. 30 meters. Hence this device can work wirelessly used for around 30 meters. Simulation result &hardware implemented shown in figure 5 & 6 respectively.As per the design and application of this device, if properly manufactured in small size and in large amount this device can be manufactured at a very low price with high usability .This is a very noble approach to communicate bidirectionally between normal and disable person. This is very useful for the blind person as with the help of this device he can read anything which is written in normal English language and can be imprinted on the Braille embosser. People can also communicate wirelessly using this Braille embosser to blind person .Flex sensor results can also be displayed on mobile screen wirelessly using Bluetooth , in future WIFI technology will be use to increase the range of the device.

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