Providing Effective Approach for Communication among Blind, Deaf and Dumb People

Bhagyashri Shirude, Aishwarya Mohite, Kalyani Aghav, Pranjali Gade

***Abstract*— According to World Health Organization, about 285 people in the world are blind, 300 million are deaf and 1 million are dumb. In this project, we are going to propose new system-stereotype called as SHAROJAN-BRIDGE. This system is used to bridge the gap of communication among blind, deaf and dumb people. For this purpose, the system makes use of the Arduino circuit, sensor glove consisting of sensor. Sensors are used to recognize the hand gestures and accordingly it is converted to audio or text as per the ability of the user. With the help of the proposed system people with various sensory disabilities would be able to communicate among themselves as well as with the normal people also.**

***Index Terms*—Arduino circuit, Communication technology, Sensor, SHAROJAN BRIDGE, Web mining.**

I. INTRODUCTION

The developments in the science and technology have made our life so easier and comfortable that we even do not have to move our body to do a task. But always running in the race to be ahead of everyone, we have forgotten that we still have a part of our society called as physically disabled people. These people are deprived of advancements of science and technology. The main aim of this paper is to focus on the above mentioned facts and tries to develop new technology which is helpful for different disabled people.

The main of this paper is to fill the gap in communication and bring forward technology that can help different disabled people or combination of this. We propose a new system called as SHAROJAN BRIDGE that will help to solve the above problems. Mainly SHAROJAN BRIDGE is based on the concept of wearable technology. This type of a gadget can be wear by any disabled or normal person and thus making the device flexible. We are using arduino circuit board and sensors to make the transfer of message among different people. The message transfer includes the transfer of message in the form of text or audio or Braille language as per the level of disability of person.

The contributions of this work are summarized as follows:

1. Enable the communication among various blind, deaf and dumb people.
2. Gmail reader and news reader are the two most important functionalities are also provided for the blind people by this system.

The rest of this paper is organized as follows:
Section II summarizes the existing methods. Section III presents the description of proposed method. Section IV represents the detail methodology and working of the proposed system. Section V concludes the paper.

II. EXISTING METHODS

This research investigates a new way that can be productize so that a new gadget can be developed that can bridge the gap in communication among differently abled people who suffer from any of the possible combinations of disabilities of blindness, deafness and dumbness. For this we are looking some sort of technology that can satisfy our purpose. Some of the present technologies in concern with our idea are:

A. Data Entry Glove

The data Entry glove was presented by Gary Grimes from Bell Telephone laboratories in 1983, and was the first widely published sensor glove. The data entry glove was originally devised as an alternative to the keyboard, and made it possible to generate 96 printable ASCII characters from 80 different figure positions. The glove was made out of cloth and had flex sensors along the figure, tactile sensors on the figure tips. The distribution of sensors was specified with the aim of recognizing the single hand manual alphabet for the American Deaf.

B. Multi-modal Interface

This project was proposed in order to achieve the need to convert different modalities into common medium shared and understandable by deaf and dumb individuals.
This project gave a prototype that considered of cameras attached to dark glasses along with the speaker and microphone and portable PC.

III. PROPOSED METHOD

The main of our paper is to introduce of our idea that can help to the disabled people use to communicate with each other or with other normal people as well. The SHAROJAN

BRIDGE will make communication easy between the disabled people based on the extent of their abilities. In our approach we are considering all possible combinations of the disabilities of blindness, dumbness and deafness by which a person can suffer. Our device SHAROJAN BRIDGE will take input message from differently abled sender as per his ability and facility and convert that message to be transferred to long or short distances as per the requirements. Once the message transmitted to receiver then it is again converted as per the facility and abilities of receiver.

We are making the new technology that is web mining nothing but extracting useful information from vast data. It will help blind and dumb people to get to know about current affairs via online news or any information which they want. The following Table1 describes combination and forms of message that will be converted in every possible combination of differently abled people.

Sr. No	Communication Case	Sending message by A	Reply to be send by B
1	Normal person A to blind person B	Audio message will be sent by A	Audio message will be send by B
2	Normal person A to blind person B	Audio message	Text message by B converted into text/ audio
3	Normal person A to blind and dumb person B	Audio message	Braille or text and then converted to audio
4	Normal person to Deaf and dumb person B	Audio message	Text message by B converted into text/ audio
5	Blind person A to Blind person B	Audio message	Audio message
6	Blind person A to Dumb person B	Audio message	Text message by B converted into text/ audio
7	Blind person A to Deaf and Dumb person B	Audio message	Text message by B converted into text/ audio
8	Dumb person A to blind person B	Text message will be converted into audio message	Audio message
9	Dumb person A to Dumb person B	Text message will be converted into audio message	Text message will be converted into audio message
10	Dumb person A to Deaf and dumb person B	Text Message	Text Message
11	Deaf and Dumb person A to Blind person B	Text message will be converted into audio message	Audio message will be converted into text message
12	Deaf and Dumb person A to Deaf and Dumb person B	Text Message	Text Message
13	Deaf and Dumb person to Dumb person B	Text Message	Text Message
14	Blind and Deaf person A to Blind person B	Braille message	Audio message
15	Blind and Dumb person A to Dumb person B	Message sent by A in Braille and then converted to text/audio	Text message by B converted into text/ audio
16	Blind and Dumb person A to Deaf and Dumb person B	Message sent by A in Braille and then converted to text	Text message by B converted into text/ audio
17	Blind and Dumb person A to normal person B	Message sent by A in Braille and then converted to text/audio	Audio message
18	Deaf and Dumb Person A to normal person B	Text Message	Audio message will be converted into text message
19	Blind and Deaf and Dumb person A to Blind person B	Braille message	Audio message
20	Blind and Deaf and Dumb person A to Deaf and Dumb person B	Message sent by A in Braille and then converted to text	Text message by B converted into text/ audio
21	Blind and Deaf and Dumb person A to Dumb person B	Message sent by A in Braille and then converted to text/audio	Text message by B converted into text/ audio
22	Blind and Deaf and Dumb person A to normal person B	Message sent by A in Braille and then converted to audio	Text message by B converted into text/ audio
23	Blind and Deaf and Dumb person A to Blind and Dumb person B	Braille message	Audio message
24	Blind and Deaf and Dumb person A to Blind, Deaf and Dumb person B	Braille message	Audio/text message

The SHAROJAN BRIDGE will convert the message that is sent by any of the disabled person in any form like text, audio or gestures in the form that is understandable by the other disabled person easily and transmission of data is also valid up to large distance because we are using internet technology to transmit the information over the GSM network.

The working of SHAROJAN BRIDGE is illustrated by the showing the communication between blind person and person with different disabilities as shown in the below figure.

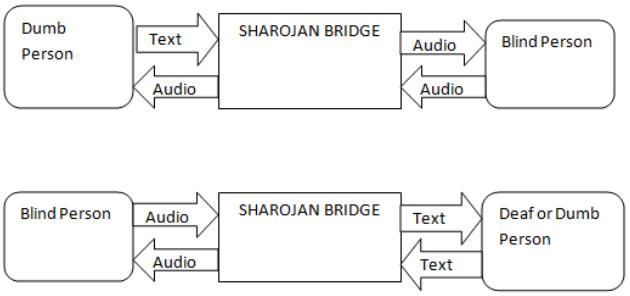


Fig: Communication between blind and person with different abilities.

STRUCTURE AND COMPONENTS OF SHAROJAN BRIGDE

The structure of SHAROJAN BRIGDE consists of following components:

A) Sensor Glove:

The sensor glove consists of four major components namely Arduino circuit board, flex sensor accelerometer, tactile sensor. The block diagram is shown below.

The gestures made by hand are feed as input to the flex sensor, accelerometer and tactile sensors whose output is given to the Arduino circuit board for gesture recognition. Once the gesture is recognized, it is converted into speech which is taken as an audio output with the help of speaker. The components of Sensor glove are described as follows:

A.1) Arduino circuit board with built in ATMEGA 328:
In this our paper we are using Arduino UNO ATMEGA 328.It has 32 KB on chip flash memory for storing codes. It also includes 2 KB SRAM and 1 KB EEPROM.

Fig:- Arduino Circuit Board with built in ATMEGA 328

A.2) Flex Sensor:

Flex sensor is 2.2" in length. As the sensor is flexed the resistance across the sensor is increases. The resistance of

flex sensor changes when the metal pads are on the outside of the bend. Connector is 0.1" and bread board friendly. Features of flex sensors are as follows:

-Angle displacement measurement

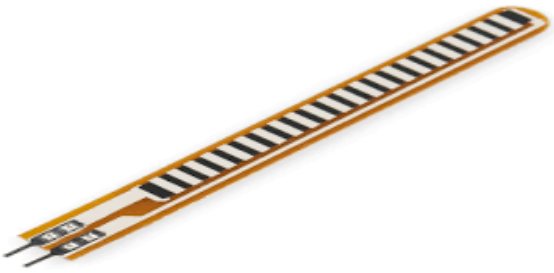
-Bends and flexes physically with motion device

Electrical specifications are as following:

-Flat resistance: 25KOhms

-Resistance tolerance: +30% or -30%

-Bend resistance range: 45K to 125K Ohms (Depending on bend radius)



A.3) Accelerometer:

Accelerometer is used for the tilt sensing. They measure both static and dynamic acceleration. It has single conditioning unit with a1-pole low pass filter, temperature compensation, self test and 0-g detect which detect linear free fall.

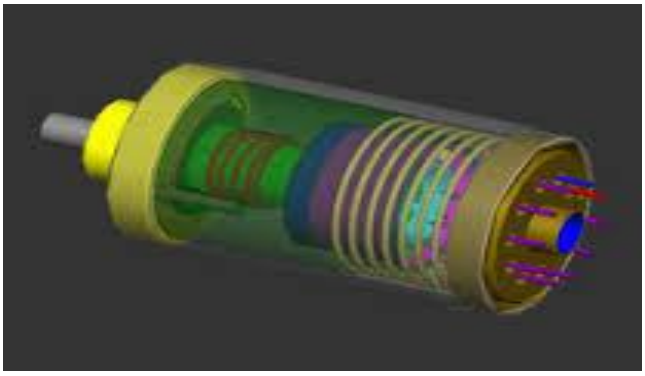


Fig: Accelerometer

A.4)Tactile Sensor:

It is type of switch which creates temporary electrical connection when pressed. It is used controller resets and input operation. The tactile sensor is connected to digital pin of Arduino and one pin is grounded. And other is supplied to +5 volts.

IV. METHODOLOGY AND WORKING

The SHAROJAN BRIDGE is proposed by taking care of all the possibilities and combinations of three disabilities namely Blindness, Deafness and Dumbness from which a person can suffer. Moreover it also considers a distance as a major barrier in communication for which it uses a technique that will remove the barrier of distance between communications of such people. The working of SHAROJAN BRIDGE for transmission of a message from one disabled person to another is described in the following steps:

- The SHAROJAN BRIDGE we are using is a type of a wearable technology and thus it is wearable on the wrist of the user. First of all output and input of the SHAROJAN BRIDGE is set to the desired form of the user.
  For example: For a blind user input can be text using the Sensor Glove or audio as per his wish and requirements of the user.
- The message to be sent by the user is taken as an input to the gadget. The input can be text, audio or Braille language. The gadget has a microphone to take the audio input, Sensor glove for the gesture input and a Braille language converter for taking the Braille language input and converting it into a text.
- If the message to be delivered by the sender is in the form that is acceptable and understandable by the receiver and the communication is a direct type of a communication, then the message is transferred directly to the receiver.
  For long distance communication, the input message is converted into audio message independent of the initial form and then it is transmitted through Internet.
  The block diagram of the SHAROJAN BRIDGE is shown in the below figure:

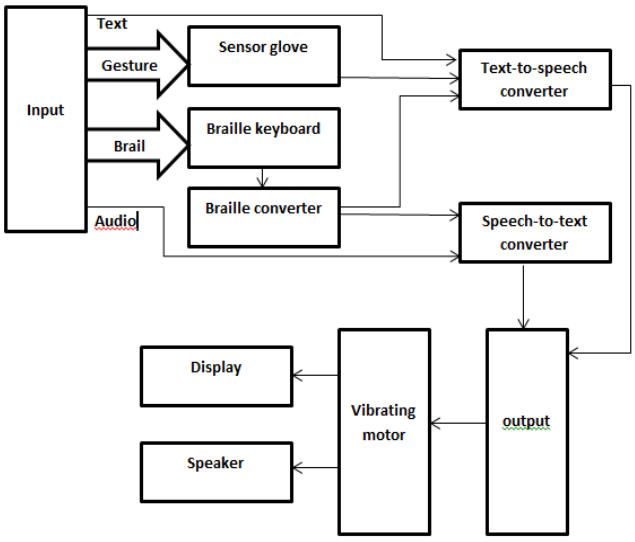


Fig: Block Diagram Of System

Let us take the example in which a deaf and dumb person wants to communicate to a Blind, Deaf and Dumb. Following are the steps that must be followed to make the communication possible.

- The Deaf and Dumb person will send a text message to the SHAROJAN BRIDGE through the sensor glove by the use of hand gestures.
- The sensor glove will then send these gestures to the system where it is converted into an audio message.
- The audio message is then converted into the text message by using the system.
- In this example the message is transmitted into the audio so it is understood by the blind people easily.
- As gestures are also converted into the text so it is understood by the deaf person as well.

V. CONCLUSION

In this paper we are using the latest and trending wearable technology which makes it possible to carry the device easily anywhere and everywhere by the disabled person which makes our device portable .The proposed system can be the useful tool in banishing the people suffering from any of the possible combination of the possible combination of Blindness, Deafness and Dumbness among themselves as well as normal people.

.

ACKNOWLEDGMENT

With based we would like to thank the actual people behind this paper. We would like to thank to our Head of Department, Dr.prof.S.S.Sane. We would like to thank prof.D.M.Kanade for his guidance at every step of this paper. We would like to thank our friends, family members for their extreme support and blessing and to the ALMIGHTY for HIS blessing.

REFERENCES

[1] Rohit Rastogi, Shashank mittal , Sajan Agrawal "A Novel Approach for Communication among Blind,Deaf, and Dumb people."
[2] Osama Nisar*, Muhman-d Anas Imtiaz, Shehwar Hussain, Omar Saleem,"Performance Optimization of a flex sesnsor Based Glove For Hand Gestures Recognition and Translation",International Journal of Engineering Research & Technology(IJERT) 5, May-2014
[3] Md R Ahsan muhmmad I. Ibrahimy, Othman o.Khalifa. "Hand motion Detection from EMG signals by using ANN based classifier for human computer interaction."
[4] Md R Ahsan muhmmad I. Ibrahimy, Othman o.Khalifa. "Hand motion Detection from EMG signals by using ANN based classifier for human computer interaction." //International Conference on Science Technology Engineering and Management [ICON-STEM'15] Journal of Chemical and Pharmaceutical Science ISSN:0974-2115
[5] D. Sturman and D. zelter ,-a survey of glove based input, IEEE Computer Graphics and Application, VOl. 14. No.1, pp.30-39,1994
[6] M.Mohandes and S.Buraiky, -Automation of the Arabic Sign Language Recognition using the power glove, Aiml Journal vol.7, no.1, pp.41-46,200007
[7] S,Sidney and E.Geoffrey, -glove talk -a neural network interface between a data glove and a speech synthesizer , IEEE transaction on neural networks, vol.4, no.1, pp.2-28,1993
[8] Anbarasi Rajamohan Hemavathy R., Dhanalaxmi, M."Deaf, Mute Communication Interpreter ", International Journal of Scientific Engineering and Tehnology vol.2 issue 5,pp:336-341(IISSN:2277-1581)
[9] Kuldeep Singh Rajput, Shashank Deshpande Uma Mudenagudi,"Interactive Accelerometeric Glove for hearing Impaired"
[10] En.wikipedia.org./American _Sign _Language.
[11] Arduino.cc/en/Main/ArduinoGsm Shield.

