Abstract

The process of communication easier for them, science and technology have been made Human life addictive to comfort but still there exists an underprivileged group of people who are fighting for finding an innovative way that can make. 300 million are deaf and 1 million are dumb, according to the world health organization about 285 million people in the world are blind. The Sharajan Bridge in an effort to bridge the gap in the process of communication between the blind, deaf and dumb people, in this project we are going to propose a new system prototype. To provide a means of communication to differently able people having one or all of the above mention disabilities, the Sharajan Bridge will make use of the Sensor Glove for communication using gestures. It is considered that a person who is deaf is also dumb but vice versa is not possible.

1. INTRODUCTION

About 285 million people in the world are blind, 300 million are deaf, 1 million are dumb and many more suffering from one or more of the above mentioned physical disabilities, according to the statistics given by the World Health Organization. The Human Life easier and comfortable within a short span of time, the developments in Science and Technology have reached to great heights in making. We have come across various technologies that have made our life so easier and comfortable that we even do not have to move our body to do a task, during the last few decades. The physically disabled
people who are deprived of the advancements of Science and Technology because it has not given them that comfort that is required by them to feel that they too are the part of the society and they too can walk hand in hand with others, but always running in the race to be ahead of everyone we have forgotten that we still have a section of our population.

There are a little means of communication between there people like the Braille Language for communication between Blind people and the Sign Language for Dumb and Deaf people. To communicate easily in the living world with other normal persons or the persons of their own kind, this paper is going to concentrate on the above mentioned fact and tries to develop a new instrument which can help differently able people (Blind, Deaf and Dumb). The people who are suffering from Blindness or Deafness or Dumbness or any combination of these three, the main aim of this paper is to bridge the gap in communication and bring forward some technology that can help out. Here we have put forwarded the proposal for a new instrument called the Sharojan Bridge which can help in solving the above mentioned problem. To make the transfer of message between differently able people possible, here we are using LAN or internet. 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 the person.

2. EXISTING SYSTEM

Before we use the concept of “affect” in human computer interaction (HCI) emotions research has been done for a huge amount of time, a history of which has been presented in the book of Emotions. Emotion is a +ve or -ve state of mentality that combines physiological input with cognitive appraisal (Oatley, 1987; Ortony et al.). Traditionally think that an aspect of cognitive science as well as it has recently been attributed to be effective on rational decision making. Predominant emotion theories illustrate that it has either making judgments, or having bodily reactions, or the both of the two. Judgments are made (such as satisfaction from the outcome of hard work) and/or bodily reactions (such as nervousness) take place based on a person’s interactions or disposition. For understanding social emotional influences in the workplace Emotional communication can be needed. Nowadays, many researchers are excited in how to integrate emotions into HCI, which has become known as affective computing (Picard, 1997). Affective computing builds an affect model based on a variety of information, which results in a personalized computing system with the ability of perception (translation), interpretation of feelings of human and generating intelligent, sensitive, and friendly responses.

Number of existing models and that model based on discrete emotion states, that don't have significant correspondence to the real environment. A book was publish in 1998 & published by Goleman that also called Working with Emotional Intelligence. In working of his, he widened the definition of emotional intelligence, told that it consists of 25 “skills, abilities and competencies” Some individuals think that it cannot possible to
affect the model, and hence, facilitate affective understanding. Picard discussed this question.

Here we propose a human interface device which is portable right hand glove [4]. We propose this device in concurrence with assistive engineering which help the underprivileged. The main aim is to find out 10 numbers and 26 alphabets of American Sign Language and shown it on the LCD. Text to speech conversion operation is carried out when the text is obtained on the LCD, and obtained a voice output. Further, the text displayed on a PC or any portable hand held device. People with hearing disability find it difficult to communicate with others using their Universal Sign Language, as a normal person doesn't understand these sign languages. Our main objective is to set an interface between the Deaf/Dumb and normal person to improve the communication capabilities so that they can communicate easily with others. We mount dual axis accelerometers [3] on the glove and propose and efficient methodology to convert these sign languages.

3. PROPOSED SYSTEM

The main motive of our paper is to introduce an idea that can help to ease the way the disabled people use to communicate with each other or with the world. The SHAROJAN BRIDGE will make the communication easy between the disabled people based on the extent of their abilities. In our approach we are considering all the possible combinations of the disabilities of Blindness, Deafness and Dumbness by which a person can suffer. Our device called the Sharajan Bridge will take the input message from the differently able sender as per his abilities and facility and convert that message to be transferred to long or short distances as per the requirements. Once the message is transmitted to the receiver then it is again converted as per the facility and abilities of the receiver. We have come across several combinations that are possible in case of the three above mentioned disabilities and the solutions to these possibilities.

3.1 How our method is useful

In this system will act as a connection link between people suffering with any combination of disabilities. The Sharajan Bridge will convert the message which is taken from disabled person in any form like text, audio, gestures or Braille Language in the form which is easily understandable by the other disabled person and the transmission of the data is also valid up to large distances because we are using

Figure 1: Communication between dumb & blind person and blind & deaf, dumb person
the internet. The following dig will describe that how communication happen among blind, deaf and dumb person or any combination of disability so that it is easy for both the communicators to understand and communicate easily.

3.2 Sensor Glove

The Sensor Glove is a latest technology and it is used for conversion of the American Sign Language (ASN) into audio which can further be converted into text and text is displayed on the LCD screen as per the requirements. The Following components involved in Sensor Glove:

Arduino Circuit board, Flex Sensors, Accelerometer and Tactile Sensors.

![Figure 2: Sensor glove](image)

An input means gestures given to the Flex Sensors, Accelerometers and Tactile Sensors and output is given to the Arduino Circuit Board for gesture recognition. Once the gesture is recognized, then it is given to TTS module and speaker used for the voice output. The components of the Sensor glove are:

3.2.1 Arduino circuit board with built in ATMEGA 328

Arduino is an open source platform which is based on simple microcontroller board. The controller used in the device is Arduino duemilanove and has inbuilt atmega 328 in it. It has 32KB on-chip flash memory for storing codes and 2KB used for boot loader. It also has a 2KB of SRAM and 1KB of EEPROM. The developed program is stored on the flash memory.

3.2.2 Flex sensors

Flex sensors are resistive carbon elements the Flex Sensor is used in accordance with the voltage divider circuit. The Flex Sensors produces a variation in the resistance when bent correlated to the bent radius. The variation in resistance is approximately 10 to 30 KOhm. An unflexed sensor has 10Kohm resistance and 30Kohm when bent at 90 degrees.

3.2.3 Tactile sensors

A tactile switch is also called as momentary button or push-to-make switch. It is commonly used for inputs and controller resets. A tactile switch creates a temporary electrical connection when pressed. One pin is supplied with +5 volts and remaining is grounded. This is connected to the Arduino digital pin.

3.2.4 Accelerometer

Accelerometer is used for measure both Static and dynamic acceleration. Accelerometers are used for tilt sensing. The sensor has a g-select input & it switches the accelerometer between Â± 1.5g and Â±6g measurement ranges. It has a signal conditioning unit with an
I-pole low pass filter, temperature compensation, Self-test, and Og-detect which detects linear free fall.

### 3.2.5. Text to speech conversion

The text output from the Arduino is converted into voice or sound using the TTS. SpeakJet is used for the conversion of text to speech and LM386 is an amplifier which is used to amplify the voice. TTS 256 is a 28 pin DIP & 8 bit microprocessor programmed with 600 letters to sound rules, works on the technique of accepting the serial data ASCII characters and it converted them into syllabic sounds.

#### 3.3 Sharajan Bridge Architecture

Sharajan Bridge is proposed for easy communication among Blind, Deaf and dumb people. The working of system for transmission of message from one disable person to another person. The input taken from user for sending message, input can be audio, text or Braille language. Message is send to disable person through the LAN or internet. Output is given to receiver; audio output is given using speaker. Braille language output is given by using Braille converter. And text message displayed on LCD or screen. For example, for communication between dumb and blind person. The input for dumb person is text or gesture and output to blind person is audio or Braille output.

![Architecture Diagram](image)

Figure 3: Architecture

#### 4. AN EXAMPLE OF A SPECIFIC CASE

Consider that communication between deaf, dumb person and blind, deaf, dumb person. Deaf, dumb person make gesture as a input. This gesture given to sensor glove. The output of sensor glove is audio message. Then audio message get converted into text message. Braille printer use for Braille output. Text message is given to the Braille printer, and then Braille output obtains from Braille printer. Braille output means paper printed with dotted language. This dotted language printed paper use by blind, deaf and dumb person to identify message.
5. CONCLUSION

Sharojan Bridge which can be a useful tool in banishing the barrier of disabilities in communication of the people suffering from any of the possible combination of Blindness, Deafness and Dumbness among themselves as well as normal people. We have taken into consideration that can arrive in case of the three type of disabilities and facilitate every disabled person and the normal person to communicate with the disabled ones. The person can communicate and transfer the message as per his ability and desire. The dumb can use their Sign language to transmit the message while those who are unable to understand the Sign Language can make use of the device to get the output in the audio form for normal or blind people and in the form of Braille Language for Blind and Deaf person. Moreover the message can also be displayed in the form of text on the LCD screen for Deaf people and even the transmission of the message can be made over large distances by the use internet. Thus this approach can tackle to any type of difficulty that can come across the process of communication among differently able people and the normal world.

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6. REFERENCES


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