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INTERACTION COMMUNICATION BETWEEN IMPAIRED PEOPLES

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Abstract- *Science and Technology have made Human lifeaddictive to comfort but still there exists an underprivilegedgroup of people who are fighting for finding an 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 .Texas Instrumentation Circuitry,SHAROJAN Bridge and Arduino Circuit Boards to provide a means of communication to differently-abled people having one or all of the above mention disabilities. It is assumed that a person who is deaf is also dumb but vice versa is not true.*

Keywords - *Accelerometer, Arduino Circuit Boards, Blind, Deaf, Dumb, Flex Sensors, Gesture, Microcontroller, Tactile Sensors, Wearable Technology.*

I. INTRODUCTION

According to the statistics given by the World Health Organization.The developments in Science and Technology have reached to great heights in making the Human Life easier and comfortable within a short span of time.During the last few decades,wehave 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. But always running in the race to be ahead of everyone we have forgotten that we still have a section of our population called the physically disabled people. Communication being a fundamental aspect of human life is very much difficult for the people who are Blind, Deaf or Dumb. 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.The main aim of this paper is to bridge the gap in communication and bring forward some technology that can help out the people who are suffering from Blindness or Deafness or Dumbness or any combination of three.

II. LITERATURE SURVEY

This paper investigates a new way that can be productize so that a new gadget can be developed that can bridge the gap in communication among differentlyabled people who suffer from any of the possible combinations of the disability of Blindness, Deafness and Dumbness.

1.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. The glove was made out of cloth and had flex sensors along the fingers, tactile sensors on the fingertips, and inertial sensors positioned on the knuckle side of the hands. The distribution of the sensors was specified with the aim of recognizing the Single Hand Manual Alphabet for the American Deaf.

2.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 blind individuals, for instance, converting images into Natural Language (NL) text. We came across various technologies that can help differently abled people to communicate among themselves and with the normal world easily but all of the technologies studied so far were focusing only a certain parameter or extent of disability among the three of Blindness, Deafness and Dumbness. None of the technology was so developed that it can be used as a general approach that can tackle any combination of these three disabilities. So to solve this purpose, we proposed an approach that can be used as a general way in which people suffering from any type of combination.

III.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 SHAROJAN BRIDGE will take the input message form the differently abled 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.

IV. DESCRIPTION

It consists of many small structural units that are assembled together to form a complete circuitry that will be capable of transmitting any type of messages between differently-abled people.

MODULE NAME:

1. FLEX SENSOR MODULE
2. AMPLIFIER MODULE
3. DISPLAY MODULE

MODULE EXPLANATION AND DIAGRAM:

1.FLEX SENSOR MODULE

The Flex Sensor patented technology is based on resistive carbon elements. As a variable printed resistor, the Flex Sensor achieves great form-factor on a thin flexible substrate. When the substrate is bent, the sensor produces a resistance output correlated to the bend radius—the smaller the radius, the higher the resistance value.

Fig: Image of Flex sensor

Flex sensors are analog resistors. They work as variable analog voltage dividers. Inside the flex sensor are carbon resistive elements within a thin flexible substrate. More carbon means less resistance. When the substrate is bent the sensor produces a resistance output relative to the bend radius. With a typical flex sensor, a flex of 0 degrees will give 10K resistance will a flex of 90 will give 30-40 K ohms. The Bend Sensor lists resistance of 30-250 K ohms

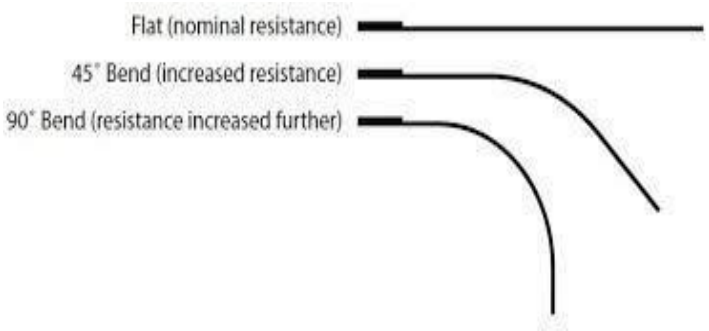

Fig:flex sensor bends

Arduino Microcontroller with Flex sensor

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.. You can tinker with your UNO without worring too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

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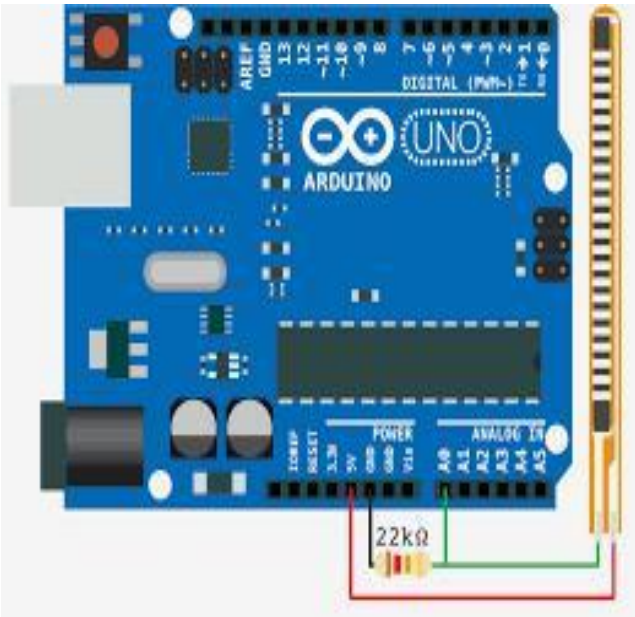


Fig:arduino with flexsensor

Technical specs

Microcontroller	ATmega328P
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328P) of which 0.5 KB used by boot loader
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
Length	68.6 mm
Width	53.4 mm
Weight	25 g

Power

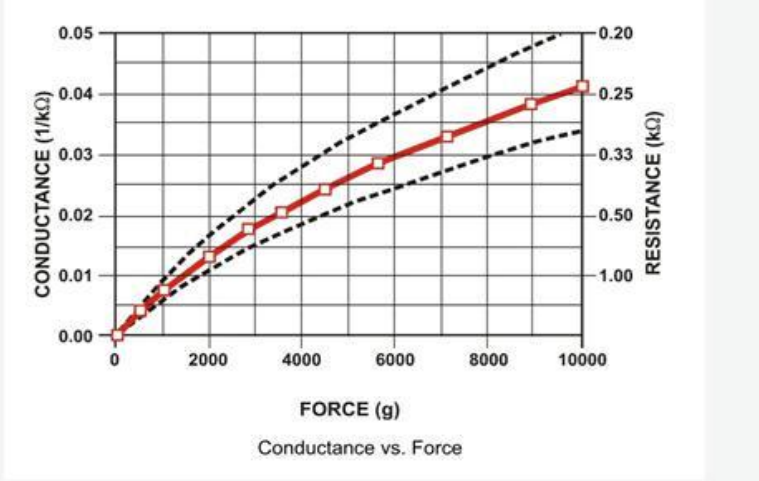
The Arduino/Genuino Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC -to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector. The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

Memory

The ATmega328 has 32 KB (with 0.5 KB occupied by the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

Sensing A Bend With A Flex Sensor + Arduino:

The flex sensor changes its resistance when flexed so we can measure that change using one of the Arduino's analog pins. But to do that we need a fixed resistor (not changing) that we can use for that comparison (We are using a 22K resistor). This is called a voltage divider and divides the 5v between the flex sensor and the resistor.The analog read on your arduino is basically a voltage meter. at 5V (its max) it would read 1023, and at 0v it read 0. So we can measure how much voltage is on the flex sensor using the analogRead and we have our reading.The amount of that 5V that each part gets is proportional to its resistance. So if the the flex sensor and the resistor have the same resistance, the 5V is split evenly (2.5V) to each part. (analog reading of 512)Just pretend that the the sensor was reading only 1.1K of resistance, the 22K resistor is going to soak up 20 times as much of that 5V. So the flex sensor would only get .23V. (analog reading of 46).And if we roll the flex sensor around a tibe, the flex sensor may be 40K or resistance, so the flex sensor will soak up 1.8 times as much of that 5V as the 22K resistor. So the flex sensor would get 3V.



Conductance vs. Force

2.AMPLIFIER MODULE

Audio Amplifier:

An audio amplifier is an electronic device that increases the strength (amplitude) of audio signals that pass through it. An audio amplifier amplifies low- power audio signals to a level which is suitable for driving loudspeakers. The input signal of an audio amplifier may only measure a few hundred microwatts, but its output may be tens or even thousands of watts. Design parameters for audio amplifiers include gain, frequency response, distortion and noise.

3.DISPLAY MODULE

Liquid Crystal Display

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals.The message is displayed lcd.

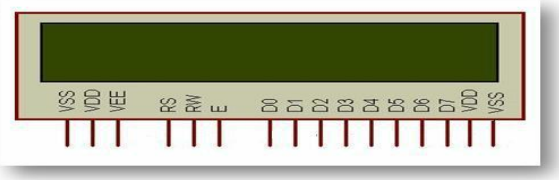


Fig:LCD Display

V. WORKING

We have taken into consideration that can arrive in case of the three type of disabilities to communicate with normal persons and disabled ones.In this,Arduino uno is given a power supply of 5v.The flex sensor is used as a input sensor which is worn on fingers of the disabled Person.The signal condition is nothing but the gesture that indicate the need of the disabled person.Based on the resistance change of the finger, the command is already programmed in the arduino. Then the message will be displayed in the form of LCD and Audio.The LCD message and audio voice are saved in SD card. The audio can be heared using Speaker.For long distance communication, the input message is converted into audio message independent of the initial form and then it is transmitted through Wireless GSM Network to the receiver.The vibrating motor also vibrates when the receiver receives the message.Vibrating motor is to produce a vibrating sensation to the user to make him aware of the message.It is mainly used in the field of medical and hospitality purpose.It is less expensive and it is portable one.

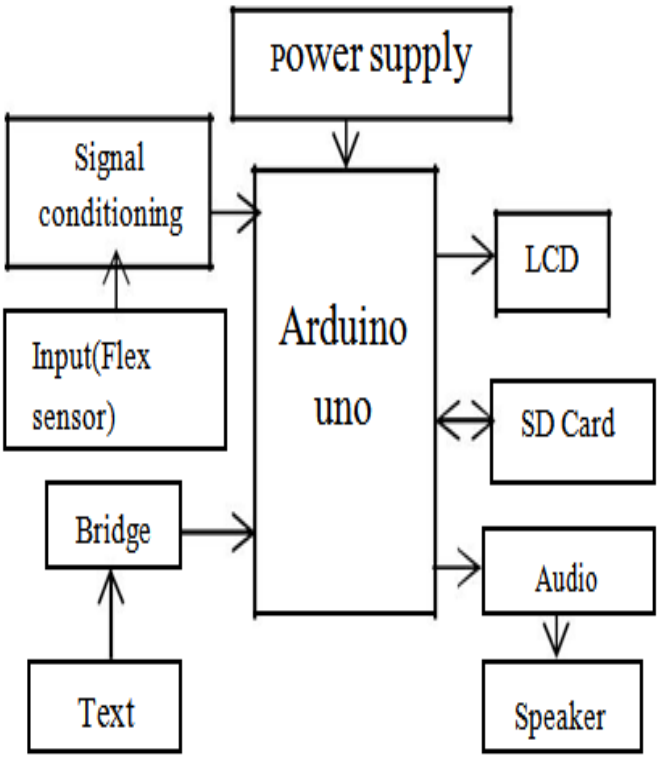


Fig:Block diagram

VI.SOFTWARE IMPLEMENTATION

Arduino IDE

The Arduino/Genuino Uno can be programmed with the (Arduino Software (IDE)). The ATmega328 on the Arduino/Genuino Uno comes preprogrammed with a bootloader that allows to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files). int flexSensorPin = A0; //analog pin 0

CODING:

```
void setup(){

 Serial.begin(9600);

}

void loop(){

int flexSensorReading = analogRead(flexSensorPin); Serial.println(flexSensorReading);

int flex0to100 = map(flexSensorReading, 512, 614, 0, 100);

Serial.println(flex0to100);

delay(250); //just here to slow down the output for easierreading. }
```

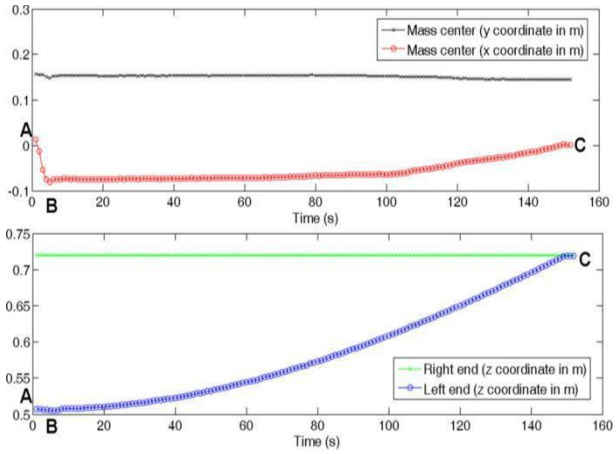


Fig:Stimulation

PROTOTYPE

Five flex sensor are fitted with each finger andthumb and voltage required is +5v. Then its output is in digital converter is used. Then this digital value goes inmicrocontroller where programming is done. There is five press button is used. First for displaying the output.Second is character print button, third is word printbutton and fourth is reset button and last is for erase button.

Fig:Project Prototype

VII. RESULT AND CONCLUSION

In this paper we have proposed the basic approach of the system we named as SHAROJAN BRIDGE which can be a useful tool in vanishing 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. The person can communicate and transfer the message as per his ability and desire. Moreover the message can also be displayed in the form of text and audio. Even the transmission of the message can be made over large distances by the use GSM Wireless Networks.

VIII.FUTURE WORK

We are using the Arduino GSM Shield to make connectivity over long distances. But we are using only the call and text message feature of this technology. In future some new way can be developed that can use the Internet connectivity feature of GSM Shield to make the connectivity of the device better and for longer distances. Arduino Technology also provides Ethernet, WI-FI and Bluetooth support. Then incorporate these features to our device to make it capable of connecting to any other device with WI-FI and Bluetooth support.

REFERENCES

[1] Anbarasi Rajamohan, Hemavathy R., Dhanalakshmi M. "Deaf-Mute Communication Interpreter", International Journal of Scientific Engineering and Technology Volume 2 Issue 5, pp: 336-341 (ISSN: 2277-1581)

[2] Kuldeep Singh Rajput, Shashank Deshpande, Uma Mudenagudi, "INTERACTIVE ACCELEROMETRIC GLOVE FOR HEARING IMPAIRED".

[3] Nikolaos Bourbakis, Anna Esposito, D. Kabraki, "Multimodal Interfacesfor Interaction-Communication between Hearing and Visually Impaired Individuals: Problems & Issues", 19th IEEE International Conference on Tools with ArtificialIntelligence.

[4]Netchanok Tanyawiwat and SurapaThiemjarus, Design of an Assistive Communication Glove using Combined Sensory Channels, 2012, Ninth International Conference on Wearable and Implantable.

[5] N.Bourbakis, An SPNG based method for image to NLtext conversion, PR Journal.

[6]G.Grimes, Digital Data Entry Glove Interface Device, AT & T Bell Labs, 1983.

[7] D.Sturman and D. ZeIter, -A survey of glove-based input, II IEEE Computer Graphics and Applications, vol. 14, no. l, pp. 30-39, 1994.

[8] M. Mohandes and S. Buraiky, -Automation of the Arabic sign language recognition using the powerglove, II AIML Journal, vol. 7, no. 1, pp. 41-46,2007.

[9]S.Sidney and E. Geoffrey, -Glove talk -a neuralnetwork interface between a data-glove and a speech synthesizer, II IEEE Transactions on Neural Networks, vol. 4, no. 1, pp. 2-8, 1993.

[10]en.wikipedia.org/wikilBraille

[11]en.wikipedia.orglwikil American_Sign_Language.

