Interpersonal linguistic and translator device for differently abled people

A PROJECT REPORT

INDEX

ABSTRACT	**5**
INTRODUCTION	**6**
PROBLEM STATEMENT	**6**
GENERAL ARCHITECTURE	**7**
LITERATURE REVIEW	**8**
GOOGLE API	**12**
SOFTWARE TOOLS	**14**
HARDWARE REQUIREMENTS	**15**
CIRCUIT AND IMPLEMENTATION	**19**
IMPLEMENTATION IN TINKERCAD	**20**
CODE	**21**
METHODOLOGY	**25**
CONCLUSION	**27**
FUTURE SCOPE & RESULTS	**28**
REFERENCES	**29**

ABSTRACT:

The ability to read, write, listen and communicate is certainly one of the most important gifts given by God, but there are people around the world who are unable to do the same. These handicapped (the blind and the deaf) people suffer a lot may it be in terms of rights, comfort and in an overall ease of life. Reaching out to people, sharing their thoughts and views and enjoying the same benefits and comforts as normal people have always been a challenge.

Less than 3% of 145 million blind people in developing countries at present are literate. At present, in most of the cases, speech output has been the medium for blind people to access materials. For content which require deep understanding such as technical texts etc., it is not an appropriate modality, moreover blind people are more accustomed to braille transcripts and adaptability issues to all audio resources is difficult. And thus, arises the need for a cheap, easily adaptable, less complex solution to the problem. Braille points are varied arrangements of raised dots representing characters which are identified by touch by visually impaired people.

The proposed system helps the impaired people to have the communication with each other and also with the normal person. All these three activities were modulated to be in a single unique system with the use of Arduino. The blind people can be able to read the words using by Voice Module, the deaf people can hear using a multi-step translator and can communicate their message through the sign which will be arranged with the help of rods connected to the servo motors.

CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction:

The ever-increasing population trend of the millennium expects new technical innovation to meet the new challenges being faced by human beings. Research and development of the project for people who are handicap in order to ensure that the facilities are as a platform of communication with dumb and deaf people. Disabled people need special services to enable them to live independently. For example, for visually impaired, it is necessary to read and write Braille skills before they can use those skills to learn or get an education to live independently. Similarly, deaf people need the skills to understand and use of sign language before they can use it to communicate with others. The project mainly focuses on the handicap people who wants to communicate with dumb and deaf people since handicap people cannot communicate by using the sign language.

There are many individuals who are completely deaf and blind. For such individuals, their primary means of communication have to do with Braille or they use some other system such as tactile sign language, where they are actually in physical contact with the person they are communicating with.

Interpersonal linguistic and translator device for differently abled people: - Empowering the deaf and the blind to communicate and interact with others.

SNAIL helps these handicapped people to interact with the real world, read, listen, speak and communicate in all ways possible. SNAIL is a hardware and software integrated project in which the software works will be carried by the user's mobile phone.

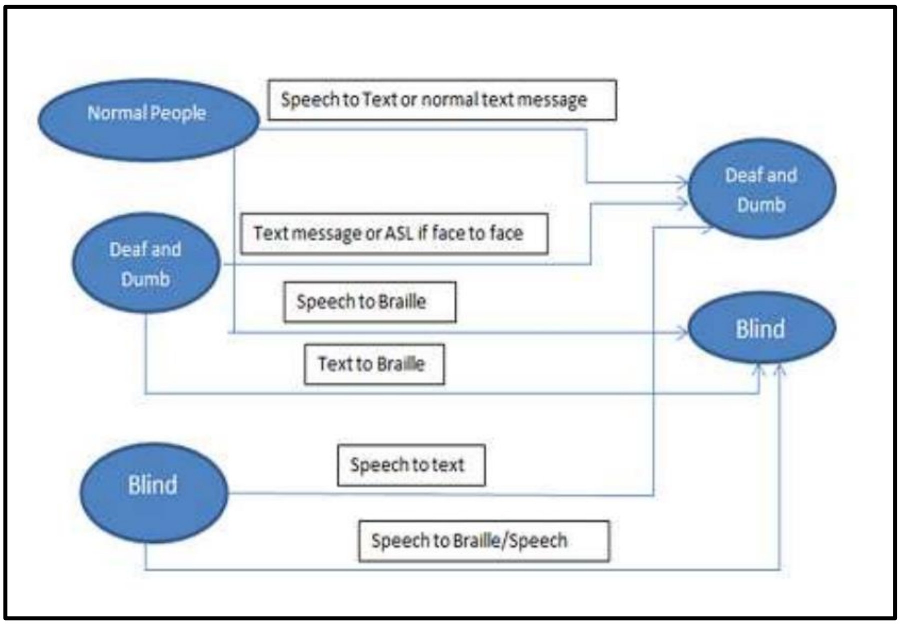
The basic way in which SNAIL works is by converting sound and text to braille real-time and making the user feel it.

1.2 PROBLEM STATEMENT:

The project is based on the sign languages to communicate with the dumb and deaf people. It is difficult for the physically handicapped people to communicate with dumb and deaf people since sign languages totally depend on the action of the hands. So, in order to solve this problem, we have come up with an idea to make the communication between the physically handicapped people and dumb and deaf people possible. The changes in the text are detected by the Arduino UNO. At the output side of the controller servo motors are connected and these servomotors are used for the finger movements by which the person can feel. The controller detects the change of the text and according to the change the servo motor is rotated and the finger is moved. Since each sensor is appointed a combination of the rods and it becomes easy to know which sensor needs to be moved to express a particular sign language.

1.3 GENERAL ARCHITECTURE:

Ways of interpersonal communication from a normal to a disabled person



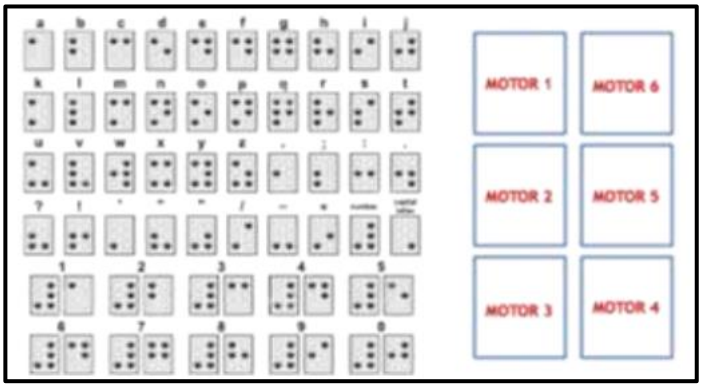


Fig : Braille for English

CHAPTER 2

LITERATURE REVIEW:

Deaf mute Communication Interpreter	This paper uses different methods like wearable communication device and Online Learning System to satisfy the mute people. They use Glove depend system, keypad method and handicom Touch screen as the types under the wearable. Online Learning is the method to interpret the external information that can be attached to it.	Sunitha K. A, AnithaSaraswathi.P, Aarthi.M, Jayapriya. K, Lingam Sunny, “Deaf Mute Communication Interpreter-A Review”, International Journal of Applied Engineering Research ,Volume 11, pp 290-296 , 2016.
An Efficient Framework for Indian Sign Language Recognition using Wavelet Transform	It proposed ISLR system: features extraction and classification. Sign language recognition is done by the Discrete Wavelet Transform based on the extraction of features and nearest neighbour classifier.	Mathavan Suresh Anand, Nagarajan Mohan Kumar, AngappanKumaresan, “ An Efficient Framework for Indian SignLanguage Recognition Using Wavelet Transform” Circuits and Systems, Volume 7, pp1874- 1883,2016.
Hand Gesture Recognition using PCA	The Paper Proposed a database based on the colour of the skin model approach and the matching component thresholding the value. This could be situated used for the Human Robotics applications. The hand section is segmented into by applying YCbCr skin colour model .Next stage is thresholding to separate the regions. Finally, Matching is done with Main Factor Analysis.	MandeepKaurAhuja, Amardeep Singh, “Hand Gesture Recognition Using PCA”, International Journal of Computer Science Engineering and Technology (IJCSET), Volume 5, Issue 7, pp. 267-27, July2015.
Hand Gesture Recognition System for Dumb People	Digital image processing system is used for static hand gesture acknowledgment. SIFT algorithm is used for hand gesture features. SIFT features has been computed at the edges which are invariant to scaling rotation, addition of noise	SagarP.More, Prof. Abdul Sattar, “Hand gesture recognition system for dumbpeople”,

An Automated System for Indian Sign Language Recognition	On the origin of shape this paper is proposed for spontaneous recognition of signs feature. Otsu's thresholding algorithm is mainly for the partition of hand region. It chooses an optimal threshold to minimise the same variations of the grey scale pixel. HU's invariant moments are served to artificial Neural Network to find the feature of partitioned hand region. Accuracy is based on the Sensitivity and Specifications	International Journal of Science and Research (IJSR)
Hand Gesture Recognition for sign Language Recognition	Sign language is the solitary mean through which the dumb and deaf people can interact. The dumb express their sensations and thoughts by means of the gesture language. Sign language identification is the method which every researcher would prefer.	ChandandeepKaur, Nivit Gill, "An Automated System for Indian Sign Language Recognition", International Journal of Advanced Research in Computer Science and SoftwareEngineering.
Design issue and proposed Implementation of communication Aid for Deaf & Dumb people	The author proposed the conversion of sign language into Indian sign language which is used to converse with the normal people where gestures of the hand is transformed into its corresponding text message .The core objective of the paper is to find an algorithm to convert the simultaneous gestures into the real time operation.	PratibhaPandey, Vinay Jain, "Hand Gesture Recognition for Sign Language Recognition: A Review", International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 3, March 2015 .
Real time Detection and recognition of Indian and American Sign Language using Sift	Hand gesture recognition for human computer interaction is the real time vision based used in this paper. The proposed paper could recognise up to 35 various hand gestures that are given by the Indian and the American Sign Language or ISL and ASL at the highest speed and with at most accuracy. To avoid false prediction the Red Green Blue to the Grey scale segmentation technique is used. In this Scale Invariant Feature Transform (SIFT) improvised version is promoted. MATLAB system is used for this model. GUI	NakulNagpal,Dr. ArunMitra.,Dr.PankajAgrawal, "Design Issue and Proposed Implementation of Communication Aid for Deaf & Dumb People", International Journal on Recent and Innovation Trends in Computing and Communication ,Volume: 3 Issue: 5,pp147 –149.

	model has been implemented to have user friendly hand gesture recognition.	
A Review on Feature Extraction 3 for Indian and American Sign Language	Based on manual communication and body language this paper presents the recent research and development of the sign language .In this paper it undergo three stages pre-processing, feature extraction and classification. Neural network (NN), Support Vector Machine (SVM), Hidden Markov Models (HMM), Scale Invariant Feature Transform (SIFT) are the methods used by the classifications.	Neelam K. Gilorkar, Manisha M. Ingle, "Real Time Detection And Recognition Of Indian And American Sign Language Using Sift", International Journal of Electronics and Communication Engineering & Technology (IJECET), Volume 5, Issue 5, pp. 11-18 , May2014
SignPro-An Application Suite for deaf and dumb	The key feature in this paper is the real time gesture to text conversion. Deaf and Dumb people can communicate with the rest of the world using sign language is the main presentation of the paper. The processing stages include: Gesture extraction, gesture matching and conversion to speech. Gesture extraction has to undergo various stages in the image processing like the histogram matching, bounding box computation, skin colour segmentation and region growing. Techniques applicable for Gesture matching include feature point matching and correlation based matching. The other features include in the application are the voicing out of text and text to gesture conversion.	Neelam K. Gilorkar, Manisha M. Ingle, "A Review on Feature Extraction for Indian and American Sign Language", International Journal of Computer Science and Information Technologies, Volume 5 (1) ,pp- 314-318,2014.
Offline Signature Verification Using Surf Feature Extraction and Neural Network Approach	Offline signature recognition and verification using neural network is proposed in this paper, where the signature is caught and offered to the user in an image format.	AshishSethi, Hemanth ,KuldeepKumar,BhaskaraRao ,Krishnan R, "Sign Pro-An Application Suite for Deaf and Dumb", IJCSET , Volume 2, Issue 5, pp-1203-1206, May2012.
Recognizing Hand Gesture using Wrist Shapes	Virtual button system is used for the sign representation. It uses the shape of the wrist. Even a pinch of action could be noted. Using	J. Lim, D. Lee, & B. Kim, "Recognizing Hand Gesture using Wrist Shapes", 2010

	this motion is a favourable because to identify the picking, moving and releasing activity in natural way. Small sized IR optic sensor for the pattern of finger tendons is used. It specifies the moving ways of the finger. It also measures the applied force for the picking operation which is not possible by the vision approach. Virtual button implementation in possible by using the small sized IR sensor is the final report produced. It can also recognise the other hand motion like shaking and bending.	Digest of Technical Papers of the International Conference on Consumer Electronics (ICCE), Las Vegas, 2010, pp 197-198
Measurement of flow using bend sensor	This paper provides an innovative design and accurate approach to the measurement of flow rate for moderate flow application. Linear bond between duration of flow and the variation in resistance of the bend sensor is deduced in this setup. Installation and calibration of sensor is easy. It consists of one moving end with a fixed beam cantilever which would provide a digital output. The open end of the sensor are analysed using ANSYS finite element analysis software provides the displacement value.	C.R. Srinivasan, S. Sen, A. Kumar, C. Saibabu, “Measurement of Flow Using Bend Sensor”, 2014International Conference on Advances in Energy Conversion Technologies (ICAECT), 2014, pp 27-30

CHAPTER 3

HARDWARE AND SOFTWARE REQUIREMENTS

3.1 SOFTWARE REQUIREMENTS

3.1.1 Google speech to text api:

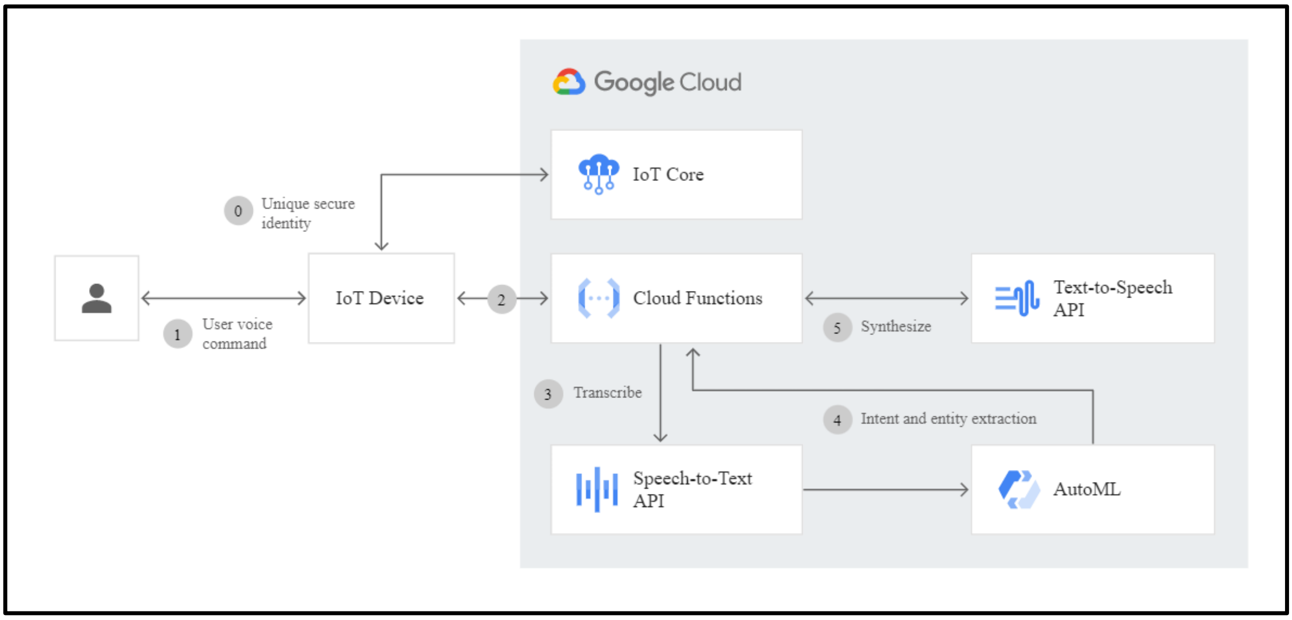


Fig : Google Cloud API services

Google cloud Speech to text aides the developers in the conversion of audio into text as it applies robust neural network models in a convenient API. It enables voice command and control and transcribes audio. It is capable of processing real-time streaming or pre-recorded audio using Google's ML technology. The accuracy is unparalleled as the most advanced deep learning neural network algorithms are applied by Google. It streams text results, returning text as it is recognized from audio stored in a file and is capable of long-form audio as shown in Figure 3.

Google cloud Speech to text API provides the following features:

Global vocabulary	Support your global user base with Speech-to-Text's extensive language support in over 125 languages and variants.
Streaming speech recognition	Receive real-time speech recognition results as the API processes the audio input streamed from your application's microphone or sent from a prerecorded audio file (inline or through Cloud Storage).
Speech adaptation	Customize speech recognition to transcribe domain-specific terms and rare words by providing hints and boost your transcription accuracy of specific words or phrases. Automatically convert spoken numbers into addresses, years, currencies, and more using classes.
Speech-to-Text On-Prem	Have full control over your infrastructure and protected speech data while leveraging Google's speech recognition technology on-premises, right in your own private data centers. Contact sales to get started.
Transcription evaluation	Upload your own voice data and have it transcribed with no code. Evaluate quality by iterating on your configuration.

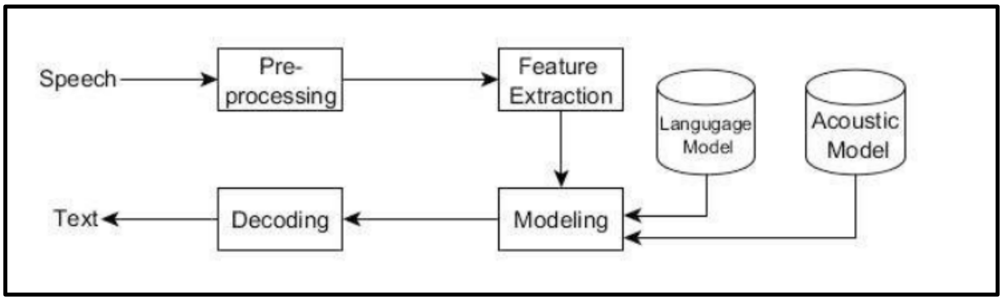


Fig : Speech to Text conversion flow

3.1.2 Google Text to Speech API:

Google Text to Speech API is one of the several APIs available in python to convert text to speech as shown in Figure 4. It is commonly known as the gTTS API. It is an easy and efficient tool which converts entered text, into audio that can be saved as an mp3 file.

Google cloud text to speech API provides the following features:

Custom Voice (beta)	Train a custom speech synthesis model using your own audio recordings to create a unique and more natural-sounding voice for your organization. You can define and choose the voice profile that suits your organization and quickly adjust to changes in voice needs without needing to record new phrases. Learn more.
Voice and language selection	Choose from an extensive selection of 220+ voices across 40+ languages and variants, with more to come soon.
WaveNet voices	Take advantage of 90+ WaveNet voices built based on DeepMind's groundbreaking research to generate speech that significantly closes the gap with human performance.
Text and SSML support	Customize your speech with SSML tags that allow you to add pauses, numbers, date and time formatting, and other pronunciation instructions.

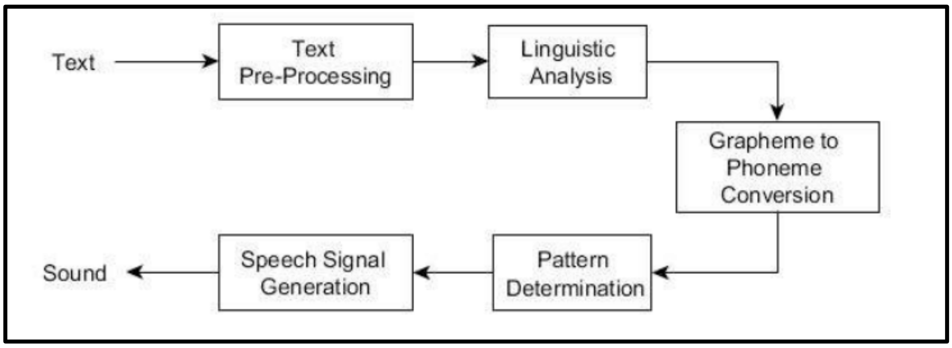


Fig : Text to speech conversion flow

3.2 Software Tools:

For the user-end part, we could build a android application and integrate the speech to text conversion

• Android Studio can used to build the Android application.

• Arduino IDE: used to program Arduino

- Used programming Languages : C++ language is used to code the Arduino and python can be used for application development.

Tkinter:

Various options for the development of graphical user interfaces are provided by python. Tkinter is the standard GUI (graphical user interface) provided as a library for python. GUI applications can be created in a faster and easier way using Tkinter, and it also provides a prevailing object-oriented interface to the Tk GUI toolkit.

Tinkercad – We used tinkercad environment for simulating the hardware parts in real time. Tinkercad is a free online collection of software tools that help in making simulations online.

3.3 HARDWARE REQUIREMENTS:

Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, 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.

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-9V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) (0.5 KB used by bootloader)
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

Fig : Specifications of Arduino UNO

The power pins are as follows:

• VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

• 5V. The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.

• 3V A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA. • GND. Ground pins.

Fig : Arduino UNO

SERVO MOTOR:

The servo motor is different from a normal DC motor as it can only rotate in 180 degrees . The servo motors need a 5 V DC supply, and a control signal based on pulse width modulation to control the position. Pulse width modulation is a technique where the on time of a signal is controlled w.r.t the total signal time.

Here the signal used has a total time (time on plus time off) of 20ms. So the time for which the high pulse is given determines the location the servo motor should go to.

- For a 0.5ms duration of a 5V pulse, the servo motor needs to go to 0 degree position.
- For a 1.5ms duration of a 5V pulse, the servo motor needs to go to 90 degree position.
- For a 2.5ms duration of a 5V pulse, the servo motor needs to go to 180 degree position. After receiving the input pulse, the servo motor gets the current position of the motor and hence decides the direction and time period for which the wheel attached must rotate, hence sending the wheel or the pointer (in this case) to the desired position.

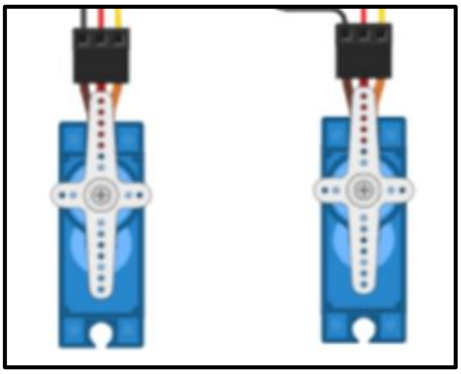


Fig : Servo motor

Active Buzzer Module:

Active Buzzer Arduino module produces a single-tone sound when signal is high. To produce different tones use the Passive Buzzer module. The Active Buzzer module consists of a piezoelectric buzzer with a built-in oscillator. It generates a sound of approximately 2.5 kHz when signal is high.

Operating Voltage	3.5V ~ 5.5V
Maximum Current	30mA / 5VDC
Resonance Frequency	2500Hz ± 300Hz
Minimum Sound Output	85dB @ 10cm
Working Temperature	-20°C ~ 70°C [-4°F ~ 158°F]
Storage Temperature	-30°C ~ 105°C [-22°F ~ 221°F]
Dimensions	18.5mm x 15mm [0.728in x 0.591in]

Fig : Buzzer

Connecting wires:

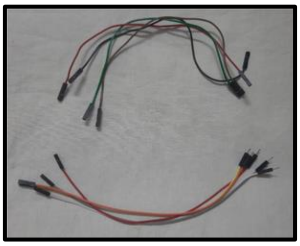


Fig: Connecting wires

Connecting wires are used to establish connections between different components in the circuit.

4x4 Keypad:

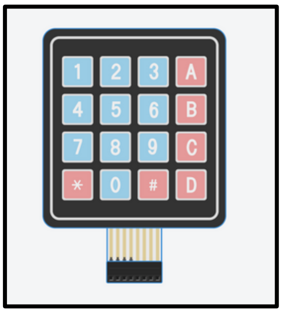


Fig: 4 X 4 Keypad

A 4x4 matrix keypad is used as an input device that takes inputs from the users. It consists of 16 pins in total with four rows and four columns. On pressing a key, a connection will be established between the corresponding row and column between which the switch is placed.

CHAPTER 4

CIRCUIT AND IMPLEMENTATION

4.1 CIRCUIT CONNECTION:

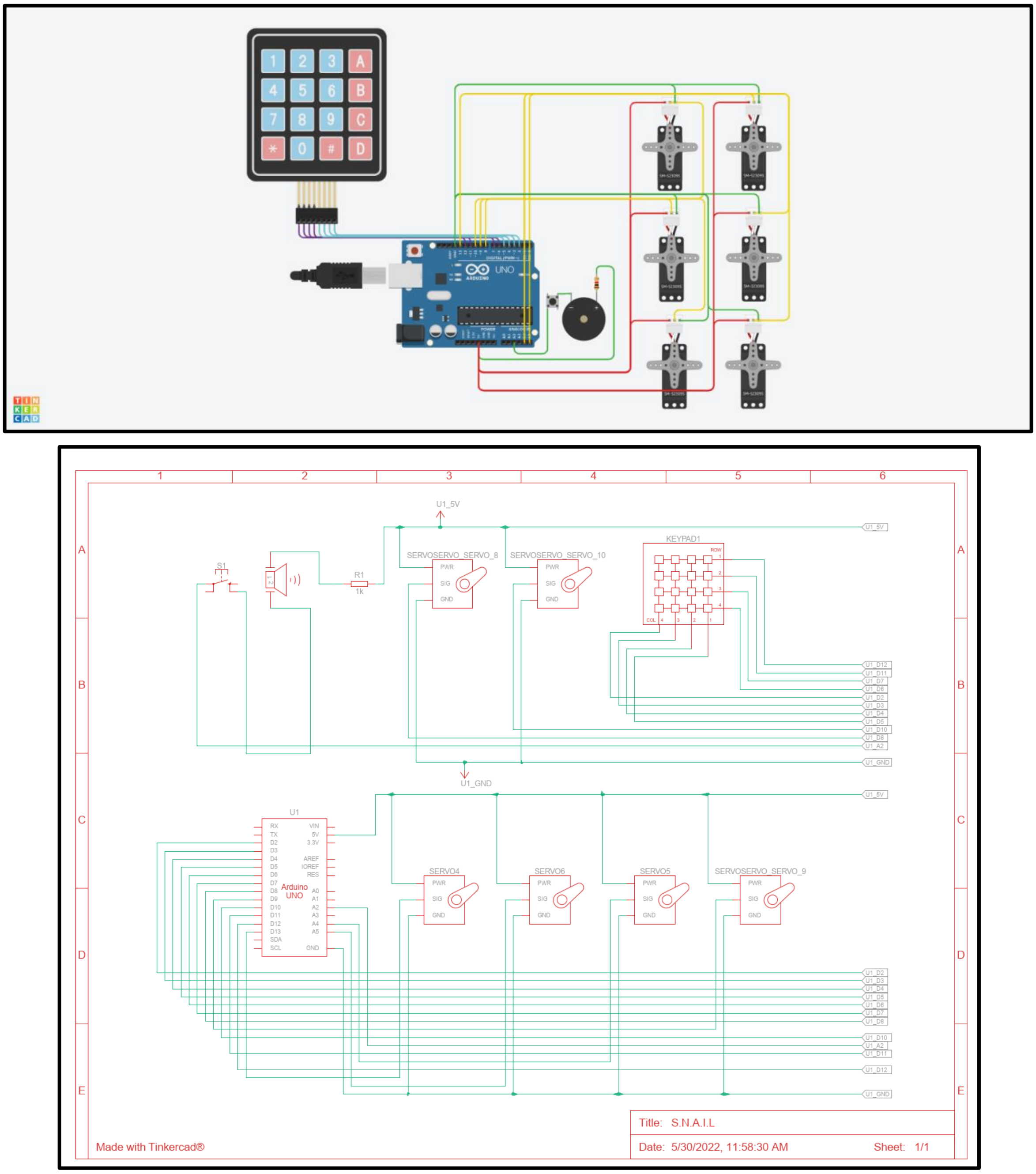


Fig : Tinkercad Implementation screenshot

4.2 IMPLEMENTATION IN TINKERCAD:

https://www.tinkercad.com/things/5VOfGlztiIl-spectacular-crift/editel?sharecode=tx1cq-t88GKrIVq4QEmce00nc5E3mprPmNOWHXMghyc

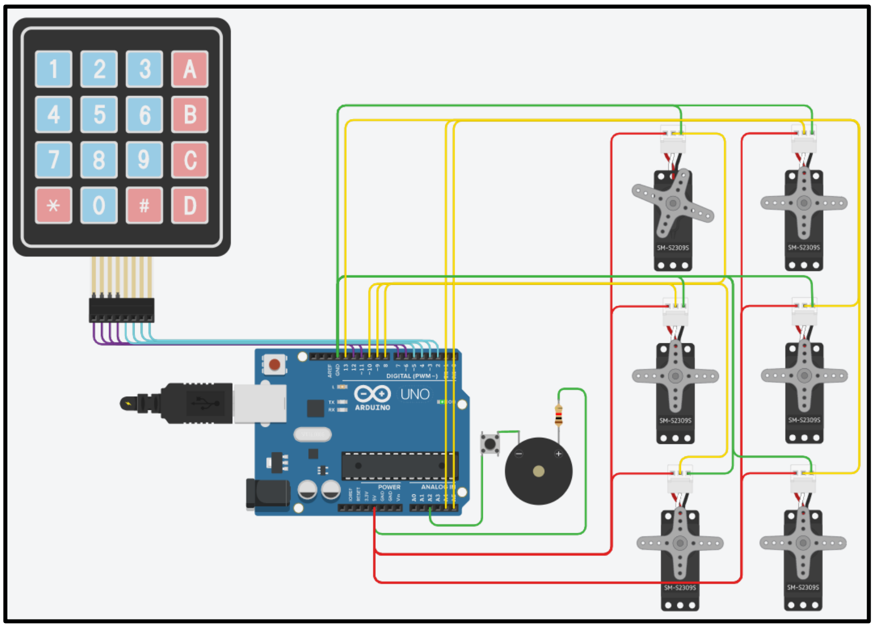
4.3 CODE:

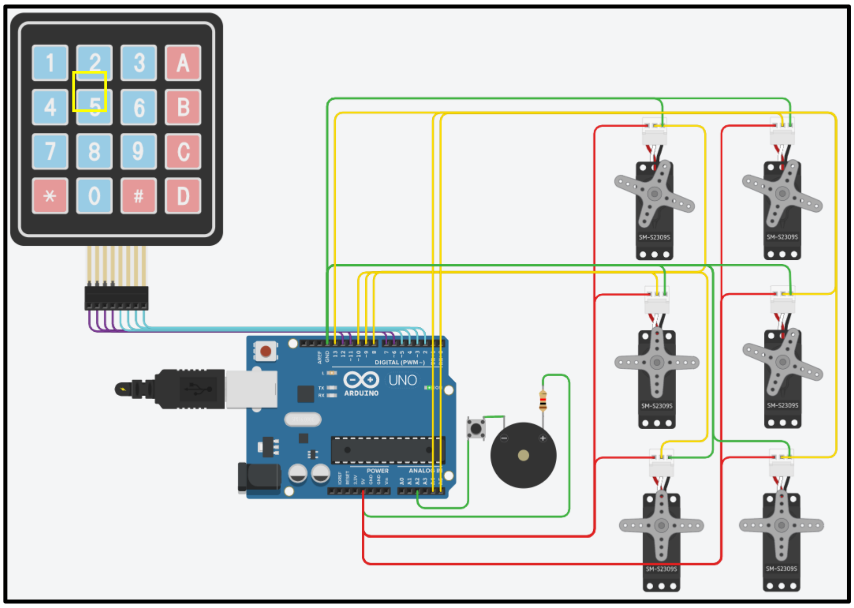
```
#include <Servo.h>

#include <Keypad.h>

const byte rows = 4;
const byte cols = 4;
char hexkeypad[rows][cols] = {{'1','2','3','A'},
                              {'4','5','6','B'},
                              {'7','8','9','C'},
                              {'*','0','#','D'}
                              };

byte rowspins[rows] = {12,11,6,7};
byte colspins[cols] = {5,4,3,2};

Keypad kpd = Keypad( makeKeymap(hexkeypad), rowspins, colspins, rows, cols );

byte i = 0;


Servo servo_A4;

Servo servo_A5;

Servo servo_8;

Servo servo_9;

Servo servo_10;

Servo servo_13;

void setup()
{
    pinMode(A2, OUTPUT);

Serial.begin(9600);
    for (i=0; i<8; i++)
    {
        pinMode(i,OUTPUT);
    }

{

servo_A4.attach(A4, 500, 2500);

servo_A5.attach(A5, 500, 2500);

servo_8.attach(8, 500, 2500);

servo_9.attach(9, 500, 2500);

servo_10.attach(10, 500, 2500);

servo_13.attach(13, 500, 2500);

}
```

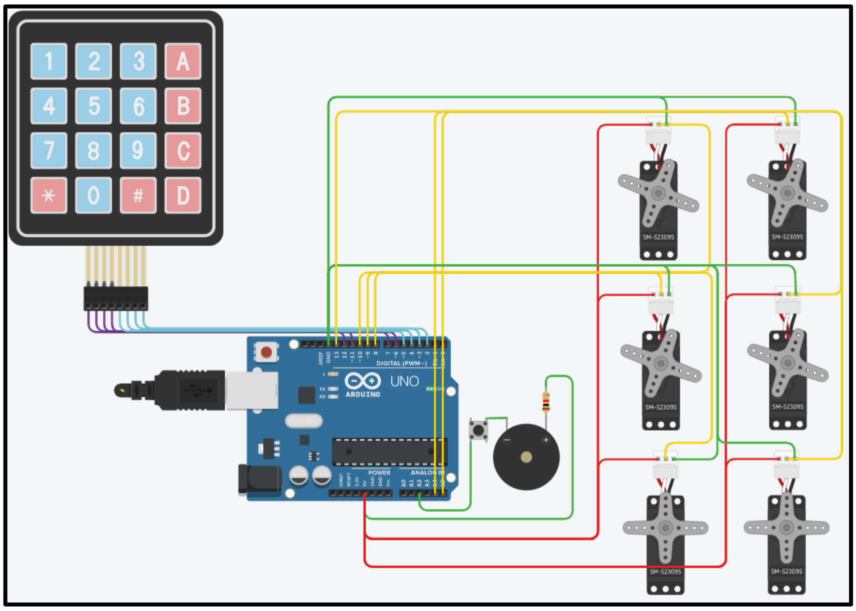
```
    {   servo_A4.write(0);

     servo_13.write(0);
        servo_A5.write(0);
        servo_8.write(0);
        servo_9.write(0);
        servo_10.write(0);}


}

void loop()

{


    tone(A2, 200, 100);


    char keypressed = kpd.getKey();
    int result = kpd.getKey();
    if (keypressed)
    {
        Serial.print("Key Pressed is ");
        Serial.println(keypressed);


        if (keypressed == '1') {
        servo_A5.write(0);
            servo_A4.write(0);
                servo_8.write(20);
            servo_9.write(0);
                servo_10.write(0);
                    servo_13.write(0);



     if (keypressed == '2') {
     servo_A5.write(0);
         servo_A4.write(0);
             servo_8.write(20);
         servo_9.write(20);
             servo_10.write(0);
                 servo_13.write(0);



     }
     if (keypressed == '3') {
     servo_A5.write(20);
         servo_A4.write(0);
             servo_8.write(20);
         servo_9.write(0);
             servo_10.write(0);
                 servo_13.write(0);
     }
     if (keypressed == '4') {
     servo_A5.write(20);
         servo_A4.write(20);
             servo_8.write(20);
         servo_9.write(0);
             servo_10.write(0);
                 servo_13.write(0);

     }
     if (keypressed == '5') {
     servo_A5.write(0);
         servo_A4.write(20);
             servo_8.write(20);
         servo_9.write(0);
             servo_10.write(0);
                 servo_13.write(0);

     }
```

```
        if (keypressed == '6') {
         servo_A5.write(20);
             servo_A4.write(0);
                 servo_8.write(20);
             servo_9.write(20);
                 servo_10.write(0);
                     servo_13.write(0);


         }
         if (keypressed == '7') {
         servo_A5.write(20);
             servo_A4.write(20);
                 servo_8.write(20);
             servo_9.write(20);
                 servo_10.write(0);
                     servo_13.write(0);


         }
         if (keypressed == '8') {
         servo_A5.write(0);
             servo_A4.write(0);
                 servo_8.write(20);
             servo_9.write(0);
                 servo_10.write(0);
                     servo_13.write(0);


         }


         if (keypressed == '9') {
         servo_A5.write(20);
             servo_A4.write(0);
                 servo_8.write(20);
             servo_9.write(20);
                 servo_10.write(0);
                     servo_13.write(0);


         }
         if (keypressed == '0') {
         servo_A5.write(20);
             servo_A4.write(20);
                 servo_8.write(0);
             servo_9.write(20);
                 servo_10.write(0);
                     servo_13.write(0);


         }
         if (keypressed == 'A') {
         servo_A5.write(0);
             servo_A4.write(0);
                 servo_8.write(20);
             servo_9.write(0);
                 servo_10.write(0);
                     servo_13.write(0);


         }
```

```
        if (keypressed == 'B') {
        servo_A5.write(0);
            servo_A4.write(0);
                servo_8.write(20);
            servo_9.write(20);
                servo_10.write(0);
                    servo_13.write(0);


        }
        if (keypressed == 'C') {
        servo_A5.write(20);
            servo_A4.write(0);
                servo_8.write(20);
            servo_9.write(0);
                servo_10.write(0);
                    servo_13.write(0);


        }
        if (keypressed == 'D') {
        servo_A5.write(20);
            servo_A4.write(20);
                servo_8.write(20);
            servo_9.write(0);
                servo_10.write(0);
                    servo_13.write(0);


        }


    }

    delay(10);
}
```







CHAPTER 5

5.1 METHODOLOGY:

The basic way in which SNAIL works is by converting sound and text to braille real-time and making the user feel it. When the user receives a phone call, the speech to text converter starts its job and it gets converted to braille the same way, live. This is made possible by a software downloaded to the phone. Once the speech is converted into braille, the signal is transmitted to a device with the dimensions of an oxymeter (Size of 1/3rd the index finger), this device contains a set of 6 (3 x 2) rods.

The rods get triggered and the person feels the rods touching the person's fingers. Apart from translating phone calls, this multi-step translator can be used for hearing. Once the microphone of the mobile is switched on, automatic speech to text conversion followed by text to braille conversion starts, which then gets transmitted to the device thereby helping the person to 'hear'.

The platform can be made to brush the person's fingers so that the exact sensation is felt as for or when reading braille in books or printed ones. For the texts in mobile phones or laptops, upon being connected to the device, the text in the screen gets converted into braille first which then gets communicated to the user. The cost of the device will range from 500-700 rupees considering that it requires just a signal receiver, a microchip, the rod-platform. The rest will be done with the help of software's. The person is made comfortable with the device, by providing a learning session or a permanent platform on downloading the app. A sensor is attached below the device such that it serves as a mouse. The mouse has the canvas of the whole phone to move around and select. The semi-elastic rod platform can be clicked on to give the 'mouse click (enter)' command. The mouse is mainly intended for braille to speech converter. When the person moves the device around the mobile's keyboard (for touch-screens), when the imaginary cursor is on a particular text / number block, the rods in the platform or the device resembles that particular digit or alphabet. Upon clicking it, the letter gets selected. With practice and especially due to the fact that their touch sense is highly improvised, a person would be able to get hold of entering text and reading it quickly. When the app is switched on, upon entering of letters or digits by the person, if the app recognizes a valid word, it reads it loudly, so that they are able to 'speak'. They would be able to use chatting apps and all other apps seamlessly as all the information we perceive with our ears or eyes will be converted to a language they can understand may it navigation menus, titles, ads or anything else. The users are supposed to form a general image of apps they frequently use.

A general overview of apps like messaging, phone, emergency dial, WhatsApp, music player and more. The size of the platform differs in different sizes but the general size can be considered of that of a mouse or that of an oxymeter. Further adding on the project, an optical character recognition system along with a sensor in place of the infra-red light for operating the mouse can be made such that the text that is below the device is converted to braille one word at a time along with speech if required. This helps is converting all hard-copy books to braille books. Further on, a few switches for common phrases and custom phrases can be installed such that when the person presses the buttons on the outside, the phrase gets converted to speech. The text that is entered by the person can be stimulated to speak too.

This will help paralyzed people and people with other disabilities to communicate. All the features of the device and the app are available for all specific languages and not only English since the required software can be made for all. In short, converting phone calls into braille, phone content into braille, and real-time surrounding talks to braille conversion, e-books and other text to braille, speaking through auto text-read by giving in user input letters or numbers, conversion of normal book text or newspaper text to braille, getting access to apps and communication services, for the deaf and the blind. This will help the disabled people use phones and do much more as it promises user interaction along with display output conversion through portable devices with costs of about 700 rupees.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 CONCLUSION:

Using innovation in multiple areas and using first of a kind actuation mechanism we were able came up with a low-cost high-performance model which integrates the solution of all the disabilities at a time. This would overall serve as a great aid to people facing issue with daily interpersonal communications, learning and other areas which people could implement this system in. All these devices are proposed to overcome the sufferings of hearing and visually impaired people. Hence with these ideas we can further develop algorithm for system performance and various other parameters such as time conversion, data transfer rate, long distance communication and can also provide additional features if required. This again proves that communication is necessary for survival irrespective of impairments

6.2 FUTURE SCOPE & RESULTS:

The system can be modified to connect to the internet for communication over long distance. By connecting to a server which holds various datasets for gestures, the device’s gesture recognition can be improved. We can employ various vibration levels such as weak vibrations and strong vibrations for indicating various messages and notification to improve efficiency for disabled people.

REFERENCES:

1. Aryan et al 2021 IOP Conf. Ser.: Mater. Sci. Eng. 1123 012028
2. Kramer, J., Leifer, L.J. "A „Talking Glove‟ for Nonverbal Deaf Individual", Technical Report CDR TR 1990 0312,Center for Design Research, Stanford University
3. A Novel Approach to Communicate with Deaf Dumb and Blind Person - International Journal of Engineering Research & Science (IJOER) ISSN: [2395-6992] [Vol-3, Issue-4, April- 2017]
4. Smart Assistant for Deaf and Dumb Using Flexible Resistive Sensor : Implemented on LabVIEW Platform
5. Sangeeta Kumari, Akshay Akole, Pallavi Angnani, Yash Bhamare, Zaid Naikwadi, "Enhanced Braille Display Use of OCR and Solenoid to Improve Text to Braille Conversion", *2020 International Conference for Emerging Technology (INCET)*, pp.1-5, 2020.
6. Aruljothy.S, Arunkumar.S, Ajitraj.G, YayadDamodran.D. Jeevanantham.J, Dr.M. Subba “HAND GESTURE RECOGNITION USING IMAGE PROCESSING FOR VISUALLY IMPAIRED AND DUMB PERSON” – International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE),

2018.

7. Anish Kumar, akesh aushan, Saurabh ditya, Vishal Kumar Jaiswal, Mrs. ivyashree .V. “AN INNOVATIVE COMMUNICATION SYSTEM FOR DEAF, DUMB AND BLIND PEOPLE”–International Journal for Research in Applied Science & Engineering Technology (IJRASET),2017.
8. P. P. C., “Braille To Text and Speech for Cecity Persons,” Int. J. Res. Eng. Technol., vol. 04, no. 01, pp. 263–268, 2015, doi: 10.15623/ijret.2015.0401039
9. P. Y. N. De Silva and N. Wedasinghe, “Braille Converter and Text-To-Speech Translator for Visually Impaired People in Sri Lanka,” vol. 3, no. 1, pp. 1–9, 2017
10. R. Rastogi, S. Mittal, and S. Agarwal, “A novel approach for communication among blind, deaf and dumb people,” 2015 Int. Conf. Comput. Sustain. Glob. Dev. INDIACom 2015, pp. 605–610, 2015.