Designing of Smart Gloves for Communication of Deaf and Dumb People

Muhammed Rashid.k[1], Muhammed Anas.m[2], Muhammed Sanjeedh.vs[3] ,Shahas.pv[4],Krishna kumar R[5]
Student, Department of Biomedical Engineering, Dhaanish Ahmed Institute of Technology, Coimbatore, India[1]
Student, Department of Biomedical Engineering, Dhaanish Ahmed Institute of Technology, Coimbatore, India [2]
Student, Department of Biomedical Engineering, Dhaanish Ahmed Institute of Technology, Coimbatore, India [3]
Student, Department of Biomedical Engineering, Dhaanish Ahamed Institute of Technology, Coimbatore, India[4]
Assistant Professor, Department of Biomedical Engineering, Dhaanish Ahmed Institute of Technology, Coimbatore, India[5]

Abstract— About nine billion people in the world are deaf and dumb. How often we come across these people communicating with the normal world? The communication between a deaf and hearing person poses to be a serious problem compared to communication between blind and normal visual people. This creates a very little room for them with communication being a fundamental aspect of human life. The blind people can talk freely by means of normal language whereas the deaf-dumb have their own manual- visual language known as sign language. Sign language is a non-verbal form of intercourse which is found amongst deaf communities in world. The languages do not have a common origin and hence difficult to interpret. Deaf-Mute communication interpreter is a device that translates the hand gestures to auditory speech. Communications between deaf-mute and a normal person have always been a challenging task. The project aims to facilitate people by means of a glove based deaf-mute communication interpreter system. The glove is internally equipped with flex sensors, tactile sensors. For each specific gesture, the flex sensor produces a proportional change in resistance. The processing of these hand gestures is done in ARDUINO. The concatenation of letters to form words is also done in ARDUINO. In addition, the system also includes a text to speech conversion (TTS) blockwhich translates the matched gestures i.e. text to voice output and hence the voice output is the net output from the project.

***Index Terms*—Deaf and Dumb people, Sign language, Flex sensor**

I. INTRODUCTION

Our project detects the movement of hand and respective fingers and will generate respective output. We can create the voice based assistance system for dumb person which makes voice announcements when the person shows different hand gestures and also when the patient needs help, the emergency SOS switch is provided in order to alert the care taker through SMS and call notification. The input is taken from using the gesturers of fingers. . The project aims to facilitate people by means of a glove based deaf-mute communication interpreter system. The glove is internally equipped with flex sensors, tactile sensors. For each specific gesture, the flex sensor produces a proportional change in resistance. The processing of these hand gestures is done in ARDUINO. The concatenation of letters to form words is also done in ARDUINO. The system also includes a text to speech conversion (TTS) block which translates the matched Gestures. The technologies that we are using are a combination of hardware and software .The hardware will take the input from the user's gestures and process in the microcontroller, giving voice and displays as output. The proposed model contain other components such as 16*2 LCD display, GSM modem, multichannel voice play back module, voice playback module, speaker, service provider.

II. STATEMENT OFPROBLEM

Deaf-Mute communication interpreter is a device that translates the hand gestures to auditory speech.

III. OBJECTIVE OF THEPROJECT

- To develop a cost effective system where disable people can communicate with normal people by using hand glove
- Translate hand gestures to auditory speech
- Text To Speech (TTS) block which translate the matched gestures i.e text to voice output
- Send messages and phone call to the care taker

IV. METHODOLOGY

Block Diagram

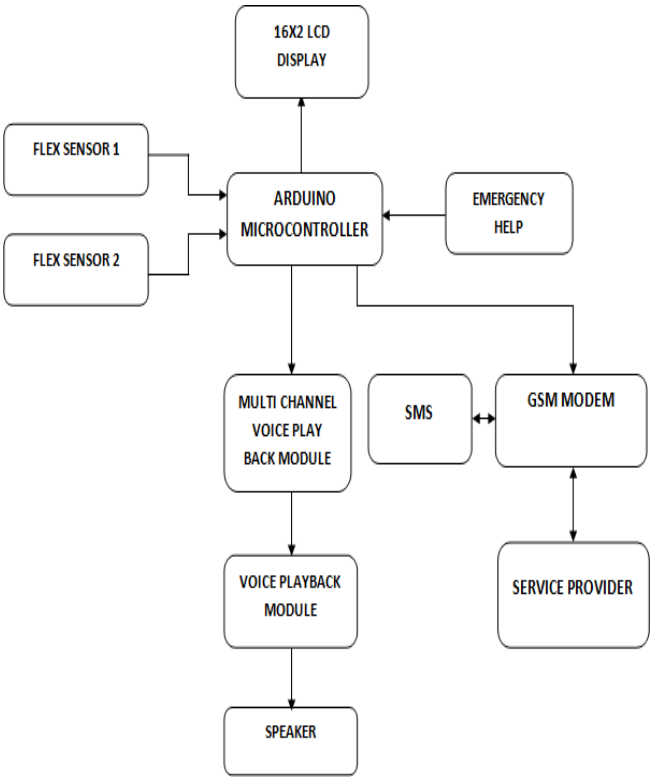


Figure 4.1 Block diagram

POWER SUPPLY

A regulated power supply is an embedded circuit; it converts unregulated AC (Alternating Current) into a constant DC. With the help of a rectifier it converts AC

Supply into DC. The power supply which stepped down to 12V

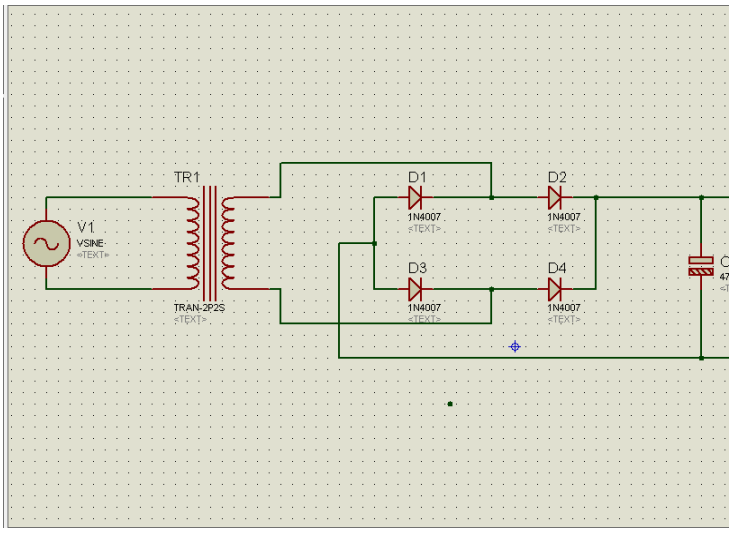


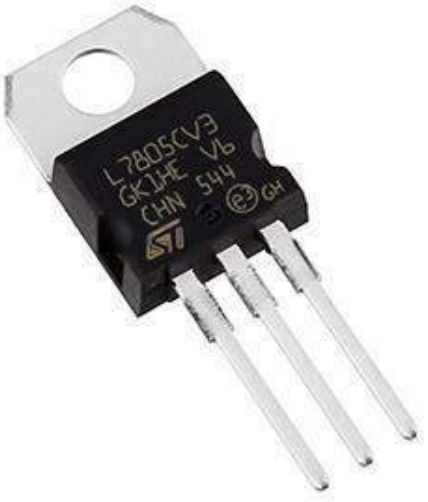
Fig:5.2 Power Supply

VOLTAGE REGULATOR

Regulator IC units contain the circuitry for reference source, comparator amplifier, and overload protection all in a single IC. The regulators can be selected for operation with load currents fromhundreds of milli amperes to tens of amperes, corresponding to power ratings from milli watts to tens of watts. The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts.

The series 79 regulators provide fixed negative regulated voltages from 5 to 24 volts. A fixed three- terminal voltage regulator has an unregulated dc input voltage, Vi applied to one input terminal, a regulated dc output voltage, Vo, from a second terminal, with the third terminal connected to ground. The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79 regulators

Provide fixed negative regulated voltages from 5 to 24 volts. For ICs microcontroller, LCD - 5 volts. For alarm circuit, op-amp, relay circuits -12 volts.



Voltage Regulator

PRODUCT DESCRIPTION

This is an LCD Display designed for E-blocks. It is a

16 character, 2-line alphanumeric LCD display connected to a single 9-way D-type connector. This allows the device to be connected to most E-Block I/O ports. The LCD display requires data in a serial format, which is detailed in the user guide below. The display also requires a 5V power supply. Please take care not to exceed 5V, as this will cause damage to the device. The 5V is best generated from the E-blocks Multi programmer or a 5V fixed regulated power supply.

The 16 x 2 intelligent alphanumeric dot matrix displays is capable of displaying 224 different characters and symbols. A full list of the characters and symbols is printed on pages 7/8 (note these symbols can vary between brand of LCD used). This booklet provides all the technical specifications for connecting the unit, which requires a single power supply (+5V).

16x2 LCD Display SIMCOM GSM MODEM

This GSM Modem can work with any GSM network operator SIM card just like a mobile phone with its own unique phone number. Advantage of using this modem will be that its

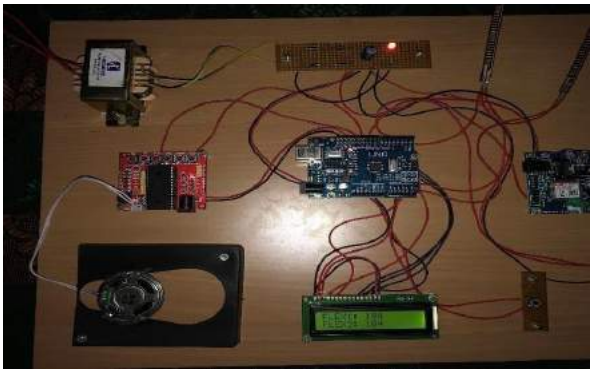
RS232 port can be used to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily using this.

The modem can either be connected to PC serial port directly or to any microcontroller through MAX232. It can be used to send/receive SMS and make/receive voice calls. It can also be used in GPRS mode to connect to internet and run many applications for data logging and control. In GPRS mode you can also connect to any remote FTP server and upload files for data logging.

GSM Modem

V. RESULT

The following diagram shows our proposed model Figure (6.1)



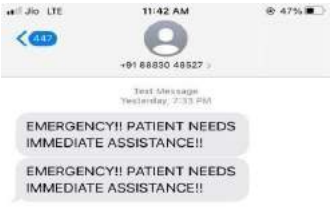
Hardware Implementation Result

Flex 1&2 In Lcd Display

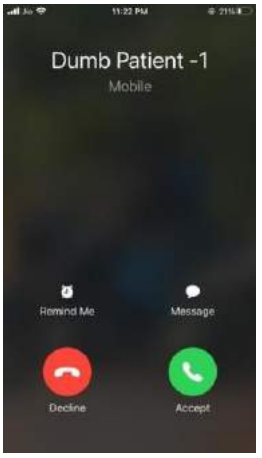
Output Of Flex 1

Output Of Flex 2

OutputOf Flex 3



Output Of Buzzer(a)



Output Of Buzzer(b)

VI. CONCLUSION

By using this project we can create the smart voice based assistance system which will continually monitor the gesture of the physically challenged person and makes the desired voice announcements. Additionally when the patient needs help, the emergency SOS switch is provided in order to alert the care taker through SMS and call notification. The project aims to facilitate people by means of a glove based deaf-mute communication interpreter system. This project is useful for dumb and deaf people to communicate with normal people. The dumb use their specific standard sign language. Which is not easily understandable by any common people and blind people cannot see their gestures. This proposed system contain gestures comprises of bending of all sensors in certain angles accordingly. Every bend of finger produces unique values. Thus we can get corresponding voice output for each gesture and message and call notification is given to the care taker.

REFERENCES

[1] Basil A. Eldadah, Elena M. Fazio, Kristina A. McLinden, "Lucidityin dementia: A perspective from the NIA", Alzheimer's & Dementia,Volume 15, Issue 8, 2019.

[2] A. S. Binti Amir Boktar, I. A. Aziz and N. S. Mohd Jaafar, "TeenagerMonitoring Mobile Application using Geofencing," 2018 IEEE Conference on Wireless Sensors (ICWiSe), Langkawi, Malaysia, 2018, pp. 1-6.

[3] J. Helmy and A. Helmy, "Demo abstract: Alzimio: A mobile appwith geofencing, activity-recognition and safety features for dementiapatients," 2017 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS), Atlanta, GA, 2017, pp. 994- 995.

[4] F. Fahmi, B. Siregar, S. Evelvn, D. Gunawan and U. Andayani, "Person Locator Using GPS Module and GSM Shield Applied for Children Protection," 2018 6th International Conference on Information and Communication Technology (ICoICT), Bandung, 2018, pp. 194-198.

[5] Carola Finch. (2016, April 28). Myths and Misconceptions About Deaf People[Online].Available URL:http://www.cput.ac.za misconceptions-about-deafpeople/

[6] Joshua Project.(2012).Deaf in Bangladesh[Online].Available URL:https://joshuaproject.net/people_groups/1 9007/BG

Authors Biography

Muhammed Anas.M, IV B.E Biomedical Engineering,Dhaanish Ahamed Institute Of Technology,K.G Chavadi, Coimbatore, Tamilnadu

Muhammed Rashid.K ,IV B.E Biomedical Engineering, Dhaanish Ahamed Institute Of Technology, K.G Chavadi, Coimbatore, Tamilnadu

Muhammed Sanjeedh.VS ,IV B.E Biomedical Engineering, Dhaanish Ahamed Institute Of Technology, K.G Chavadi, Coimbatore, Tamilnadu

Shahas.PV ,IV B.E Biomedical Engineering, Dhaanish Ahamed Institute Of Technology, K.G Chavadi, Coimbatore, Tamilnadu

MR.R.Krishnakumar. B.E, MS, Assistant Professor, Dhaanish Ahamed Institute Of Technology, K.G Chavadi, Coimbatore, Tamilnadu