e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

IMPLEMENTATION OF SMART HAND GLOVES FOR APHASIANPEOPLES

Prof. S.M. Jena[*1], Pooja V. Gavhankar[*2], Suraj R. Dahake[*3], Rohit G. Tekam[*4], Bhagyashri A. Chavhan[*5]

[*1]Assistant Prof, Department of Electrical Engineering, Jagadambha College of Engineering & Technology, Yavatmal, Maharashtra, India.

[*2,3,4,5]Students, Department of Electrical Engineering, Jagadambha College of Engineering & Technology, Yavatmal, Maharashtra, India.

ABSTRACT

Generally, a person who has a language disorder is brought by harm in a specific region of the brain that controls language expression and appreciation. Aphasia leaves a person unable to spread effectively with more. Many people have an Aphasian as an outcome of stroke. So, this project aims to lower this barrier in communication. It is based on the want of developing electronic equipment that can convert sign language into speech to make the convey take place between the mute group with the general public possible. A Wi-Fi data glove is applied which is an average fabric driving glove suitable with flex sensors along the expanse of each finger and the thumb. The person who has havoc like Aphasian or paralysis can use the gloves to fulfill hand gestures and it will be converted into speech so that normal people can understand their expression. Sign language is the language managed by quiet people and it is a conveying ability that uses gestures rather than resonates to convey related simultaneously combining hand shapes, orientations, and movement of the hands to express smoothly a speaker's thoughts. Signs are used to communicate words and judgment to the crowd. A sign in sign language is a particular movement of the hands with a special shape made out of them. In this project Flex Sensor Plays a major role, Flex sensors aresensors that change in resistance depending on the measure of a twist on the sensor. We are in process of developing a prototype using this process to reduce the conveying gap between differentially able and normal people.

Keywords: Aphasia, Flex Sensor, Gesture, Sign Language.

I. INTRODUCTION

The main idea of this design is to drop communication handicaps between normal humankind and special person who are not suitable to make a normal discussion be it a disabled bone or mute bones As person communicate and know each other through generality and ideas. The swish way to display your idea is through speech. But some humans don't have the power of speech; the only way to spread with others is through sign language. We can say that it's limited to the same set of people that can't talk. So, there is a bear of technology that decreases this gap through systems that transfigure sign language into speech. This design is not on the solicit as a purchasable product but is a moral illustration of machine knowledge for gesture recognition. The problem with sign language is that it's confined to people who are also deprived of the power of speech. It's especially concentrated for scholars with special necessary who can't speak but can be nonspecific to gesture recognition, not just concurrence. The idea of the design is to develop a hand glove get-ready with sensors analogous to a Flex detector, Accelerometer, or Touch detector which smell different sign language signals. Flex sensors are placed on galettes that measure the bending of galettes according to a gesture made. An accelerometer is placed on the palm which estimates the position of the hand in the X, Y, Z axes. Touch sensors are put in between the croquette and measure if there is any contact between the galettes. firstly, sensors were struck to prize the sample data. Secondly, the tasted data from sensors is transferred to an Arduino UNO board for further processing and transfer data to an Android phone via Bluetooth module. The data will be converted into audio mode.

II. LITERATURE REVIEW

Glove grounded system has collected an array of a detector, electronics for data accession clarifying, power constrain, and an assist for detectors that can be worn on the user's hand(1).

Glove declamation II is a system that converts hand gestures to speech, which is grounded on the sign format model improved by Sidney Fels and Geoffrey Hinton, Department of Computer Science of the University of

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

Toronto(2).

Neural networks were used to apply an adaptive interface, called Glove Talk II, which contains hand gestures to control the parameters of a resemblant formant speech synthesizer to allow a stoner to speak with his hands. It's used to apply an artificial oral tract. Glove oration II is a system that converts hand gestures to speech through a flexible associate. Hand gestures are opposed and plotted constantly to 10 control parameters of a similar formant speech synthesizer. The mapping authorizes the hand to act as an artificial implicit region that outcome speech in real-time. This gives an unlimited vocabulary, and multiple languages in addition to direct control of abecedarian frequency and volume. presently, the stylish interpretation of Glove Talk II uses several input biases (including a Cyber glove, a contact glove, a Polhemus detector, and a bottom-pedal), a resemblant formant speech synthesizer, and three neural networks[3].

The gesture-to-speech task is split into vowel and an implosive aural network. The guarding network and the implosive network are trained with a sample from the user. The lyric network executes a fixed, user-defined connection between hand position and vowel sound and doesn't stay any training example from the stoner. Volume, elementary frequency, and stop implosives are produced with a fixed mapping from the input bias. Harmeet Kaur, et al. in their paper, presented a brief description of the one attempt that was made to convert sign language to an accessible form. In their paper, they've scanned the former try over this technology and also indicate colorful feasible ways to apply the design of a simple smart glove[4].

Speak Surge is a sound synthesizer that is used to replace textbook data with voice[5].

III. BLOCK DIAGRAM

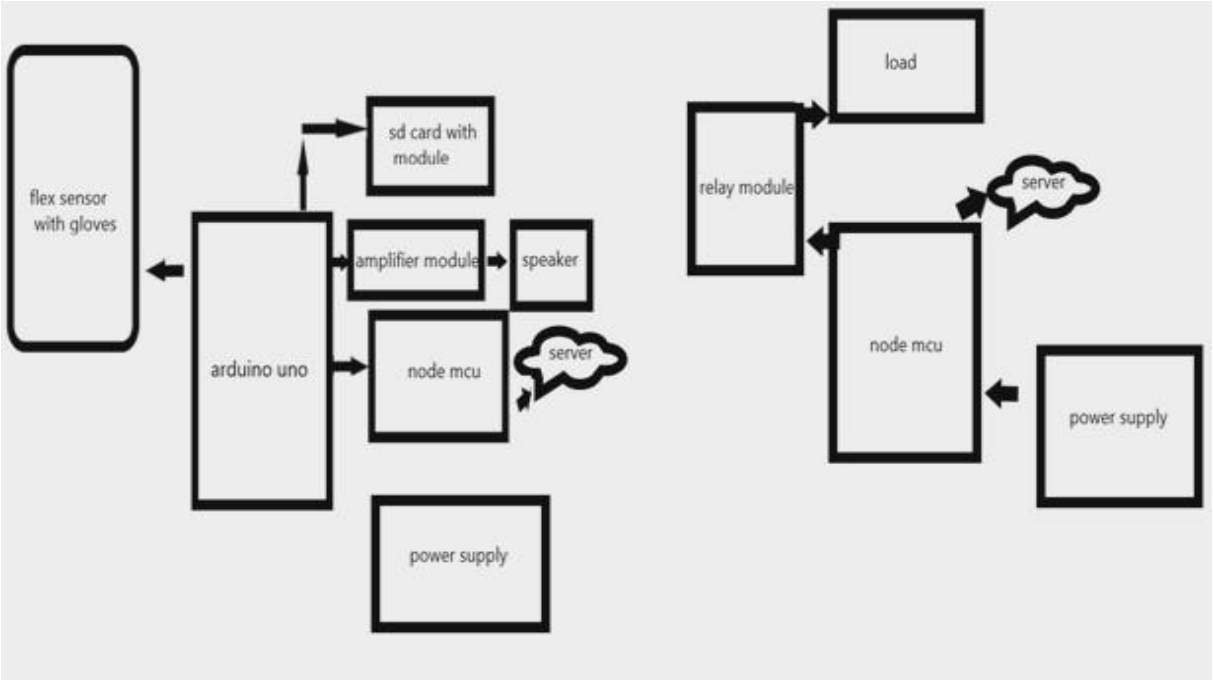

Fig 1: Block Diagram

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

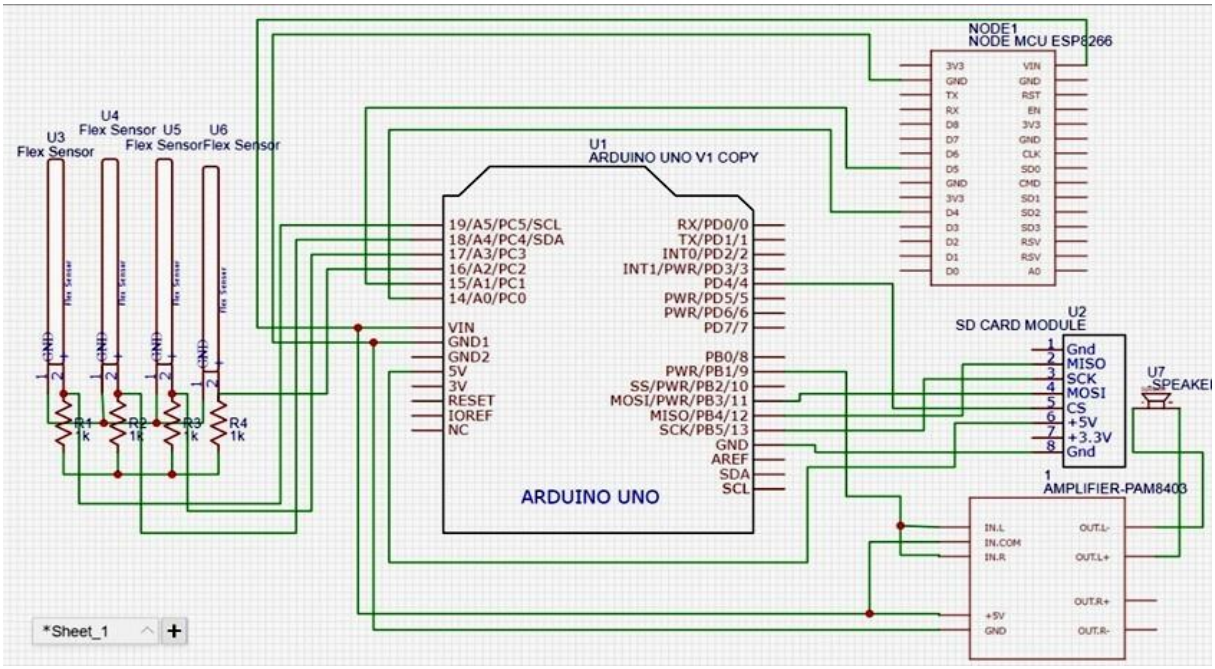

Fig 2: Circuit Diagram

IV. WORKING

For working on these gloves we exploited the flex sensor, this sensor performs on the bending strip principle which means whenever the strip is curled also its resistance will be changed. This can be considered with the assistance of any controller. This sensor performance is similar to an adjustable resistance because when it turns also the resistance will be changed. The resistance change can depend on the linearity of the face because the resistance will be different when it's positioned.

When the detector is curved 450 also the resistance would be varied. also, when this sensor is curved to 900 also the resistance would be other. These three are the flex detector's curving situation. According to these three cases, the resistance will be normal in the first case, the resistance will be double as varied in the first case, and the resistance will be four- times when matched with the first case. So, the resistance will be expanded when the twist is raised.

Fig 3: Smart Hand Gloves

V. HARDWARE REQUIREMENTS

1) Arduino Uno
2) Flex Sensor
3) NodeMCU
4) BC548-NPN Transistor
5) Two Pin Connectors
6) Relay Module

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

Arduino Uno :

Arduino is an open-source computer tackle and software company, design, and user community that designs and makes microcontroller-grounded equipment for rearing digital bias and collective objects that can scent and manage the anatomic world.

Fig 4: Arduino Uno

Flex Sensor:

A flex detector is a kind of detector that is used to measure the quantum of dereliction else bending. The designing of this detector can be done by using accouterments like plastic and carbon.

Fig 5: Flex Sensor

This sensor tasks on the twisting strip principle which means at all the strips are twisted also their resistance will be changed. This can be considered with the assistance of any controller. This sensor works similarly to a variable resistance because when it spins also the resistance will be changed. The resistance change can depend on the linearity of the face because the resistance will be different when it's positioned.

NodeMCU :

NodeMCU is an open-source LUA-based firmware developed for the ESP8266 Wi-Fi chip. By exploring functionality with the ESP8266 chip, NodeMCU firmware comes with the ESP8266 Development board/kit i.e., NodeMCU Development board. Since NodeMCU is an open-source platform, its hardware design is open for editing/modification/building.

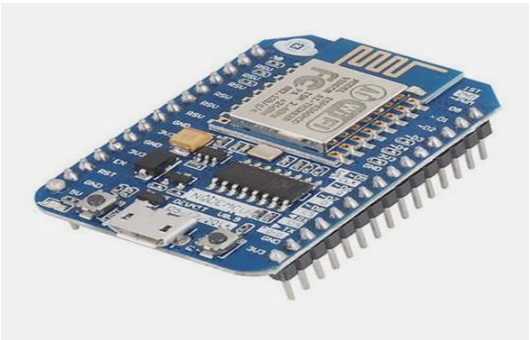

Fig 6: NodeMCU Development Board

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

Lua scripts are generally used to decode the NodeMCU. Lua is an open-source, featherlight, embeddable scripting language erected on top of C programming language. For further information about how to write Lua script for NodeMCU related to Getting started with NodeMCU using ESPlorer IDE.

BC548-NPN Transistor:

BC548 is an NPN transistor so the collector and emitter will be left open(Rear bias) when the base leg is held at earth and will be ended(Forward bias) when a signal is handed to the base leg. BC548 has a gain value of 110 to 800, this value determines the modification capacity of the transistor. The maximum quantum of current that could flow through the Collector's leg is 500mA, hence we can not connect loads that consume further than 500mA using this transistor. To poison a transistor, we've to supply current to the base leg, this current(IB) should be limited to 5mA.

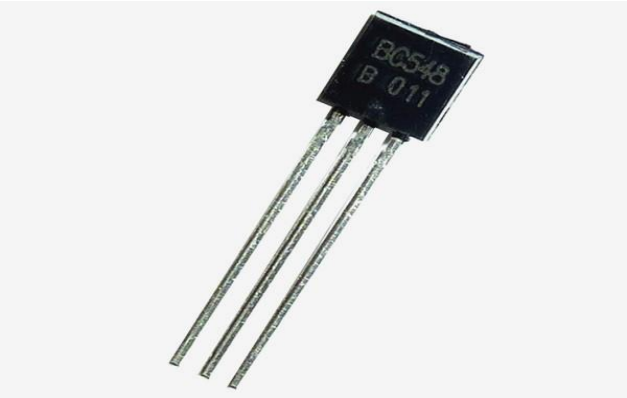

Fig 7: BC548-NPN Transistor

Two Pin Connectors :

Connection is used to join the arm of circuits together. generally, a connector is used where it may be desirable to dissociate the subsections at some unborn time power inputs, supplemental connections, or boards that may need to be replaced.

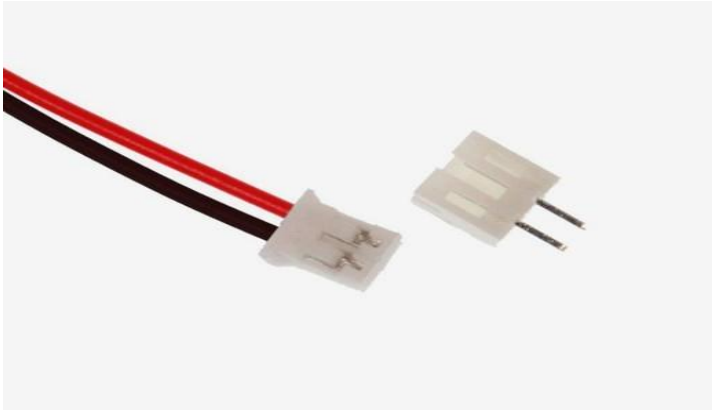

Fig 8: Pin Relay Terminal

2- leg entrapments correspond to two flat or round legs with a bone 'called' molten' or ' live ' and the other assigned the ' impartial'. When connected to an electric circuit, the current overflows from the live legs through the bobby captain and into the device. Adapters are used to combine sections of circuits.

Relay Module :

So, a relay is a switch that operates (opens and close) circuits bionic. The main work of this device is to create or fracture contact with the assistance of a signal without any lethal involvement to switch it ON or OFF. It's substantially used to control a high-powered circuit using a low-power signal.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

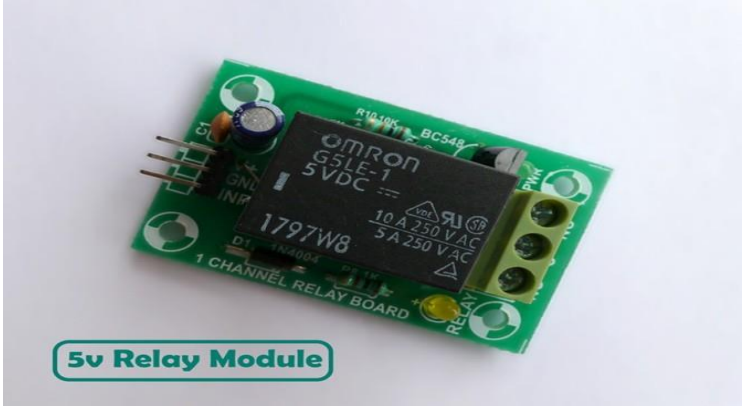

Fig 9: Relay Module

The relay is an electrically operated switch. Generally, used relay modules are 5v/12v. The relay uses an electromagnet to mechanically switch electric appliances. A relay can be controlled by a relatively little electric current that can turn ON or OFF a much bigger electric current. Using relays is secure as there is no physical contact between NodeMCU and AC devices.

VI. RESULT

Smart Gloves help impaired people to lead a normal life. Their commerce with others is only by using their hands and expressions. They generally have a tough time talking to others and hence this will help them communicate. It helps him to convert his/ her hand gesture into a textbook and voice. Secondly, the tasted data from sensors is transferred to an Arduino UNO board for further processing and transfer data to an Android phone via Bluetooth module. The data will be transformed into audile mode.

VII. ADVANTAGES

1. A gesture-grounded circuit is used for speechless cases & physically challenged people.
2. The pre-determined gesture is used to express their studies and blazoned as voice.
3. Lightweight.
4. Flexible to druggies.
5. Small in size, due to small size we can place its tackle on our hand fluently.
6. A flex detector is used to descry the expression and reused by the microcontroller.
7. It's taking smaller factors so its cost is low.

VIII. DISADVANTAGES

1. Precision and clarification of the system may be slow.
2. We may have some difficulty in performing the glove.
3. These gloves cannot catch the facial formulation.
4. Many deaf people may not want to carry around the glove or may find that the computer processing is too lagging orabnormal.

IX. CONCLUSION

The main aim of the project is to reduce the communication gap between the Aphasia community and normal people. This system is proposed to improve the lifestyle of Aphasia people. This is also favorable for degrading the communication difference between the Aphasia person. The smart glove is a very cost-effective system that can give voice to Aphasia. A smart glove is an independent glove designed for the help of an Aphasia person and to serve humanity.

X. REFERENCES

[1] Divyashree Merthia, Ayush Dadhich, Bhaskae Varma and Dipesh Patidar Porrnima Institute of Engineering and Technology, Jaipur Rajasthan India "A Speaking Module for Deaf and Dumb". SSRG International Journal ofElectronics and Communication Engineering (SSRG-IJECE) - Volume 3 Issue 8 –

August.

[2] Noor Ibraheem and Rafiqul Khan, "Survey on Various Gesture Recognition Technologies and Techniques"International Journal of Computer Applications, Vol.50, 7 July 2012, pp.38-44.

[3] Solanki Krunal, "Microcontroller Based Sign Language Glove" International Journal for Scientific Research & Development (IJSRD), Vol. 1, Issue 4, 2013, pp.831-833.

[4] Rini Akmeliawati, Melanie Po-Leen Ooi, and Ye Chow Kuang, "Real Time Sign Language Translation Using Colour Segmentation and Neural Network", IEEE on Instrumentation and Measurement Technology Conference Proceeding, Warsaw, Poland 2006, pp. 1-6.

[5] S.R. Aarthi Avanthiga and V. Balaji, "A Design Prototypic Sarcastic Gadget Technology for Perceptual Disabilities" International Journal of Recent Technology and Engineering (IJRTE), Vol.2, Issue 6, January 2014, pp.81-85.

[6] Pallavi verma, S.L. Shimi and S. Chatterji, "Design of Smart Gloves" International Journal of EngineeringResearch & Technology (IJERT), Vol.3, Issue 11, November-2014, pp.210-214.

[7] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwif06Gig73-AhX_RmwGHdc7CP0QFnoECA0QAQ&url=https%3A%2F%2Fwww.irjmets.com%2Fuploadedfiles%2Fpaper%2F%2Fissue_4_april_2023%2F35469%2Ffinal%2Ffin_irjmets1680873177.pdf&usg=AOvVaw17Y4dlDYE2YGIlCyqIDys0