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:06/June-2023 Impact Factor- 7.868 www.irjmets.com

SPEAKING SYSTEM FOR MUTE PEOPLE USING HAND GESTURES

K. Nithin Sai[*1], Y. Vipul[*2], N. Srivathsav[*3], R. Narender[*4]

[*1,2,3]Student, Dept Of Electronics And Communication, ACE Engineering College, Hyderabad, Telangana, India.

[*4]Assistant Professor, Dept Of Electronics And Communication, ACE Engineering College, Hyderabad, Telanagana, India.

DOI : https://www.doi.org/10.56726/IRJMETS42368

ABSTRACT

It's very difficult for mute people to convey their message to regular people. Since regular people are not trained in hand sign language, communication becomes very difficult. In emergencies or other times when a mute person travelling or among new people communication with nearby people or conveying a message becomes very difficult. Here we propose a smart speaking system that helps mute people in conveying their message to regular people using hand motions and gestures. The system makes use of a hand motion reading system equipped with motion and flex sensors along with a speaker unit. This system is powered by a battery powered circuitry to run it. A raspberry pi is used for processing the data and operating the system. The system consists of around 10 stored messages like “need help”, “where is the toilet/washroom” and so on that help mute people convey basic messages. It's very difficult for mute people to convey their message to regular people. Since regular people are not trained in hand sign language, communication becomes very difficult. In emergencies or other times when a mute person travelling or among new people communication with nearby people or conveying a message becomes very difficult. Here we propose a smart speaking system that helps mute people in conveying their message to regular people using hand motions and gestures. The system makes use of a hand motion reading system equipped with motion and flex sensors along with a speaker unit. This system is powered by a battery powered circuitry to run it. A raspberry pi is used for processing the data and operating the system. The system consists of around 10 stored messages like “need help”, “where is the toilet/washroom” and so on that help mute people convey basic messages.

Keywords: Raspberry PI Board, Flex Sensor, Embedded System.

I. INTRODUCTION

I. In the whole world approximately about nine thousand million people are mute (deaf). How frequently will we come across the mute people communicating with the normal people? In comparison to communication between the blind and a normal sight person, the communication between a deaf and normal person is a serious problem. Amongst the deaf people in the world, sign language is a nonverbal form of intercommunication. This sign language doesn’t have a common origin and hence it is difficult to understand and translate for normal people. A device that translates the sign language to hand gestures is a mute communication interpreter. As hand sign language will not be trained by regular people, the communication between the deaf people and regular people becomes very difficult. During an emergency, a mute person who is travelling amongst new people and if he/she wants to communicate with them becomes a difficult task. For the operation of the system and processing the data raspberry pi is used. Battery powered circuit is used to power the system and to run it.The system consists of about 10 messages which will help deaf people to communicate their primary messages like “need help”, “Where is the particular address located?” and so on. For different variations of hand movement, the system reads persons hand motions. The system consists of a trigger sensor, which helps in automatically activating the system whenever the person wants to speak something. Whenever the mute person makes hand motions just impulsively, the system ensures that it does not speak. The brain of the system i.e., raspberry pi processor processes the input sensor values which are constantly received. Now for the set of received sensor values messages are matched.

II. LITERATURE SURVEY

Previously sensor gloves were used in games or in applications with custom gestures. This paper explores their use in Sign Language recognition. This is done by implementing a project called "Talking Hands", and studying

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:06/June-2023 Impact Factor- 7.868 www.irjmets.com

the results. The project uses a sensor glove to capture the signs of American Sign Language performed by a user and translates them into sentences of English language. Artificial neural networks are used to recognize the sensor values coming from the sensor glove. These values are then categorized in 24 alphabets of English language and two punctuation symbols introduced by the author. So, mute people can write complete sentences using this application. Hernandez-Reboiler; N. Kyriakopoulos; R.W. Lindeman A new instrumented approach for translating American Sign Language into sound and texwork discusses an approach for capturing and translating isolated gestures of American Sign Language into spoken and written words. The instrumented part of the system combines an Aculeolate and a two-link arm skeleton. Gestures of the American Sign Language are broken down into unique sequences of phonemes called poses and movements, recognized by software modules trained and tested independently on volunteers with different hand sizes and signing ability. Recognition rates of independent modules reached up to 100% for 42 postures, orientations, 11 locations and 7 movements using linear classification. The overall sign recognizer was tested using a subset of the American Sign Language dictionary composed of 30 one-handed signs, achieving 98% accuracy. The system proved to be scalable: when the lexicon was extended to 176 signs and tested without retraining, the accuracy was 95%. This represents an improvement over classification based on hidden Markov models (HMMs) and neural networks (NNs). P Vijayalakshmi; M Aarthi [3] The aim behind this work is to develop a system for recognizing sign language, which provides communication between people with speech impairment and normal people, thereby reducing the communication gap between them. Compared to other gestures (arm, face, head and body), hand gestures play an important role, as it expresses the user's views in less time. In the current work flex sensor-based gesture recognition module is developed to recognize English alphabets and few words and a Text-to-Speech synthesizer based on HMM is built to convert the corresponding text.

III. MODELING AND ANALYSIS

In this Project the following components are used

1. RASPBERRY PI :

A Raspberry Pi 3 board contains a BCM2837 controller which supports ARM11 processing units. This is the Broadcom chip used in the Raspberry Pi 3, and in later models of the Raspberry Pi . The underlying architecture of the BCM2837 is identical to the BCM2836. The only significant difference is the replacement of the ARMv7 quad core cluster with a quad-core ARM Cortex A53 (ARMv8) cluster. The ARM cores run at 1.2GHz, making the device about 50% faster than the Raspberry Pi 2. The Videoscope runs at 400Mhz.

The Raspberry Pi 3 Model B builds upon the features of its predecessors with a new, faster processor on board to increase its speed. It also features WiFi and Bluetooth Low Energy capabilities to enhance the functionality and the ability to power more powerful devices over the USB ports [20].

- Quad Core 1.2GHz Broadcom BCM2837 64bit CPU
- 1GB RAM
- BCM43143 WiFi and Bluetooth Low Energy (BLE) on board
- 40-pin Extended GPIO
- 4x USB 2 ports
- 4 Pole stereo output and composite video port
- Full size HDMI
- CSI camera port for connecting a Raspberry Pi camera
- DSI display port for connecting a Raspberry Pi touchscreen display
- Micro SD port for loading your operating system and storing data 3.11.3 Pin Diagram Of Raspberry Pi

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:06/June-2023 Impact Factor- 7.868 www.irjmets.com

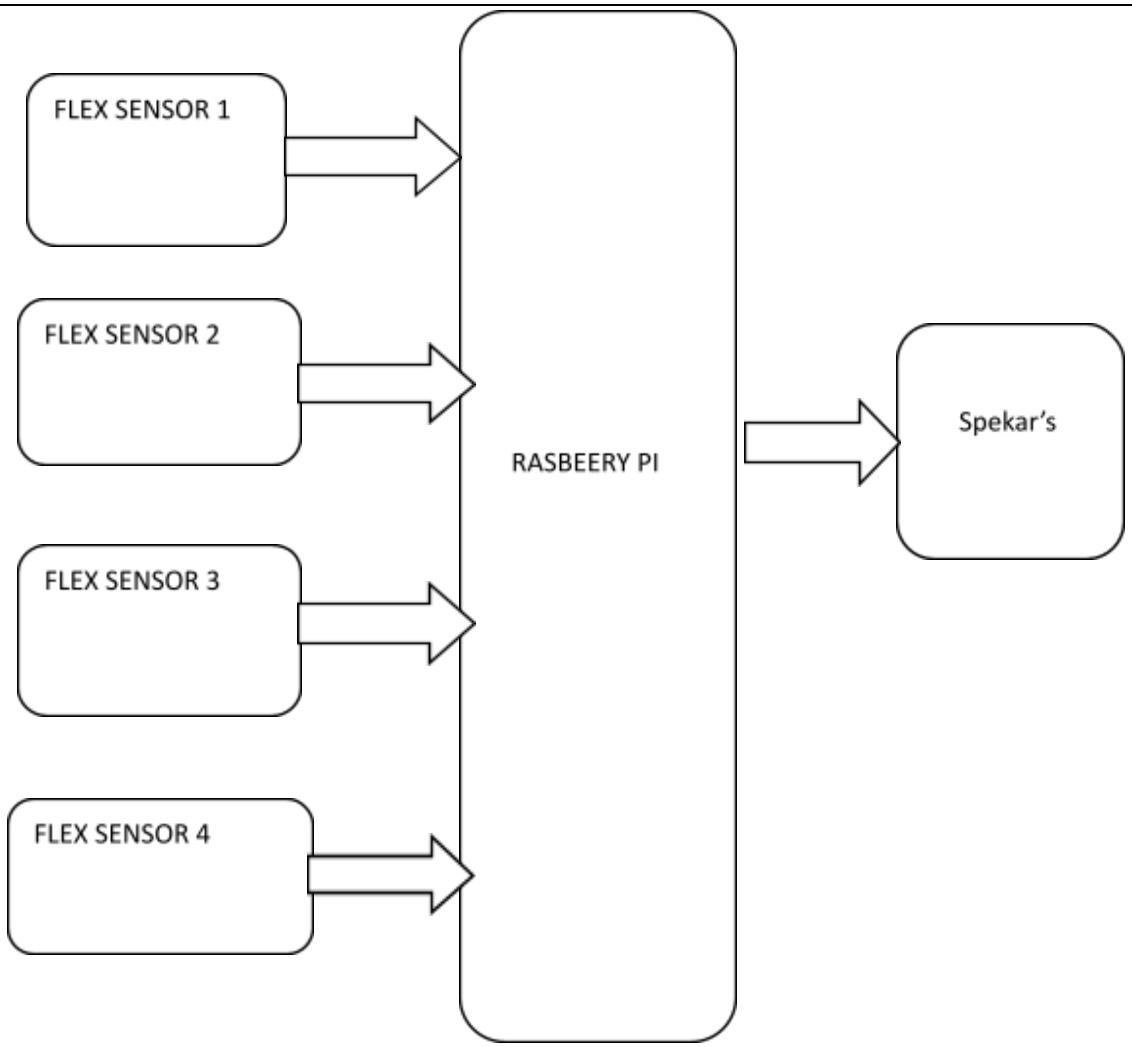

Figure 1: Block Diagram

2. FLEX SENSOR:

We know that there are different types of sensors available in the market where each sensor can be used based on the application. Likewise, a bend sensor or flex sensor is one kind of sensor used to measure the quantity of bending otherwise deflection. Generally, this sensor is fixed to the exterior, and the resistance of this sensor can be changed by twisting the exterior. These sensors are applicable in the Nintendo power glove, robot whisker sensors, door sensors, otherwise the main component in making alert stuffed animal toys.

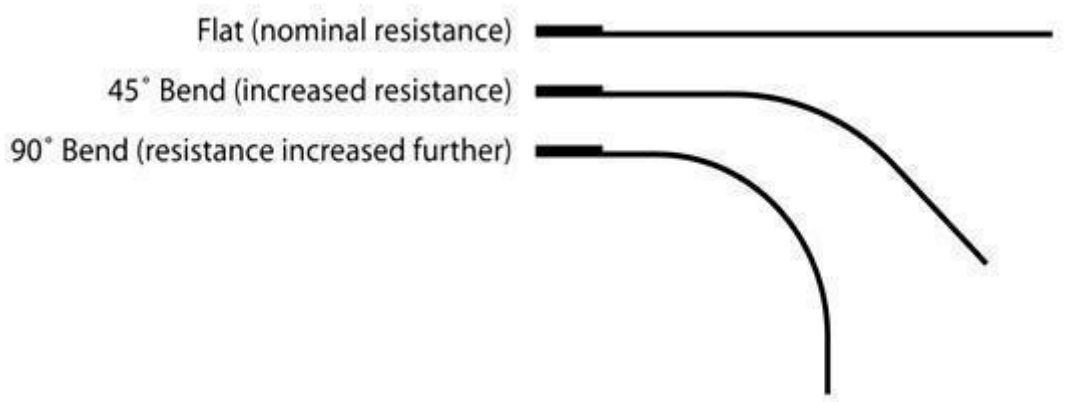

Figure 2: Flex sensor

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:06/June-2023 Impact Factor- 7.868 www.irjmets.com

IV. RESULT

Figure 3: Name of Graph (Font size-10)

V. CONCLUSION

In this project work, the sign language will be more helpful for the ease of communication between the mute people and normal people. The project mainly aims at reducing the gap of communication between the mute people and normal people. Here the methodology intercepts the mute signs into speech. In this system it overcomes the difficulties faced by mute people and helps them in improving their manner. The projected system is very easy to carry to any place when compared to existing systems.

VI. REFERENCES

[1] Raspberry Pi board–raspberry pi foundation's official website http://www.raspberrypi.org/help/faqs/ Gareth, Mitchell "The Raspberry Pi Single-Board" Engineering and technology 7.3 (2012)8.
[2] TOA Corporation, TOA Electronics, Inc. (USA) "Closed Circuit Television Systems Fundamentals Course", pril 2005
[3] Alarm Systems "A Guide to Design, Management and Procurement", The Engineering Equipment and Materials Users Association (EEMUA) publication No.191.
[4] Raspbian the operating system used in this paper http://www.raspbian.org/Raspbianimages
[5] Gantt, Charles. "Raspberry Pi Camera Module Review and Tutorial Guide" Tweak Town News. Tweak Town, 2 July 2013. Web. Oct. 2013.
[6] Motion_Detection_Programming_Guide_V1.1 GM8126.
[7] Python Sending Email Using SMTP. "Tutorials Point to Simply Easy Learning." N.p., Web.