Engineering Clinics Review-3

PROJECT TITLE- Speaking System For Mute People

Using Raspberry Pi and Python

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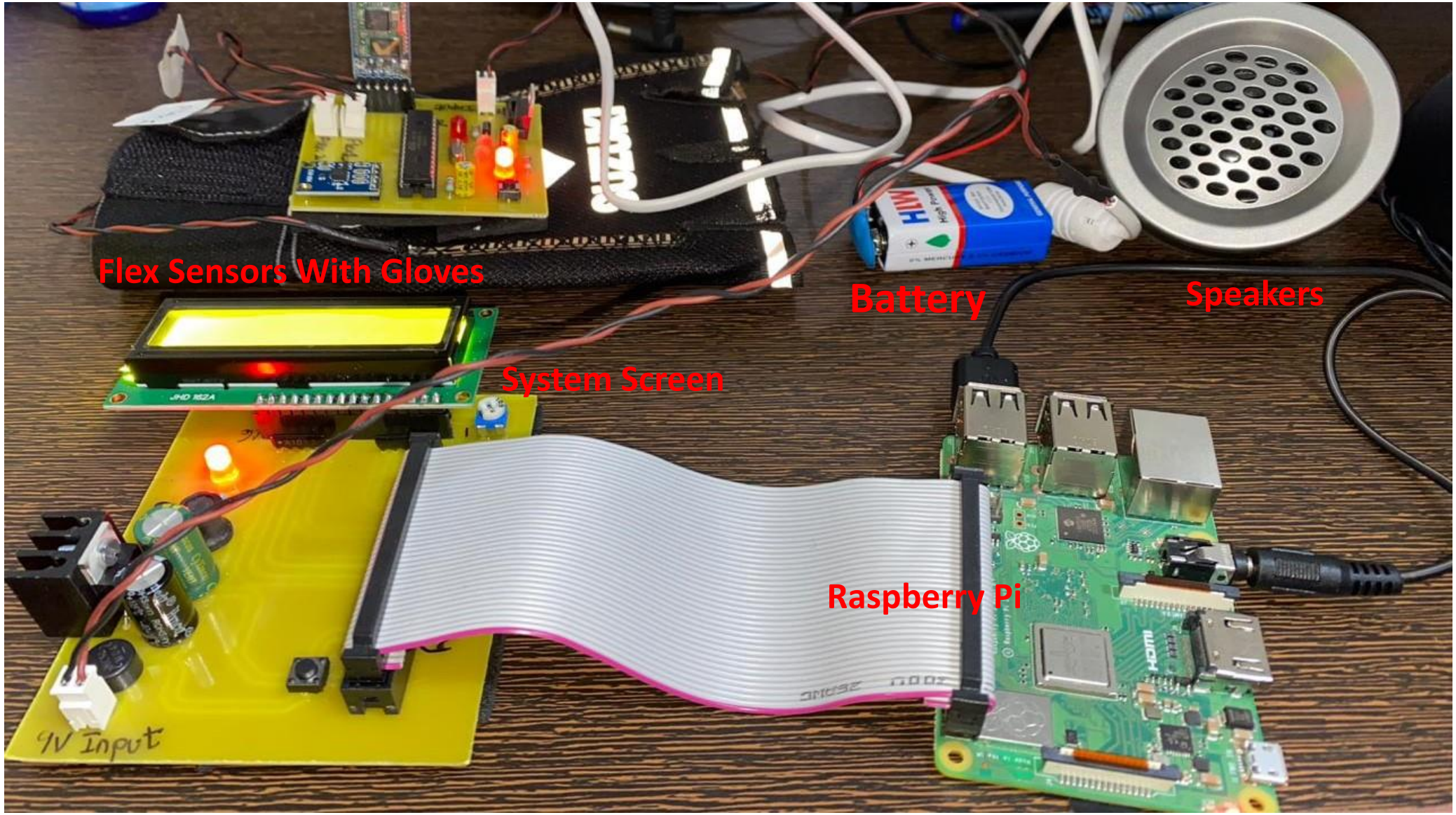
IDENTIFICATION OF THE PROBLEM AND THE TITLE OF THE PROJECT

Its very difficult for mute people to convey their message to regular people. Since regular people are not trained on hand sign language, the communication becomes very difficult. In emergency 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 help 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.

The system reads persons hand motions for different variations of hand movement. It also consists of a trigger sensor in order to indicate that the person wishes to activate the system and speak something. This ensures the system does not speak when the person is just involuntarily making hand motions. The raspberry pi processor constantly receives input sensor values and then processes it. Now it searches for matching messages for the set of sensor values. Once it is found in memory this messages is retrieved and is spoken out using text to speech processing through the interfaced speaker. Thus we have a fully functional smart speaking system to help mute people communicate with regular people using a simple wearable system.

Speaking System Detailed Diagram-



Detailed Description Of The Components Used

*Gloves With Flex Sensors:

The purpose of this demonstration is to help people about the application of physics in electronics through the construction of a flex sensor glove. This glove is constructed using flex sensors to track finger movement and a gyroscope to detect hand rotation. The main focuses is on learning about how to use these sensors with a microcontroller and interpreting their outputs to move a virtual hand, created in a software called Unity.

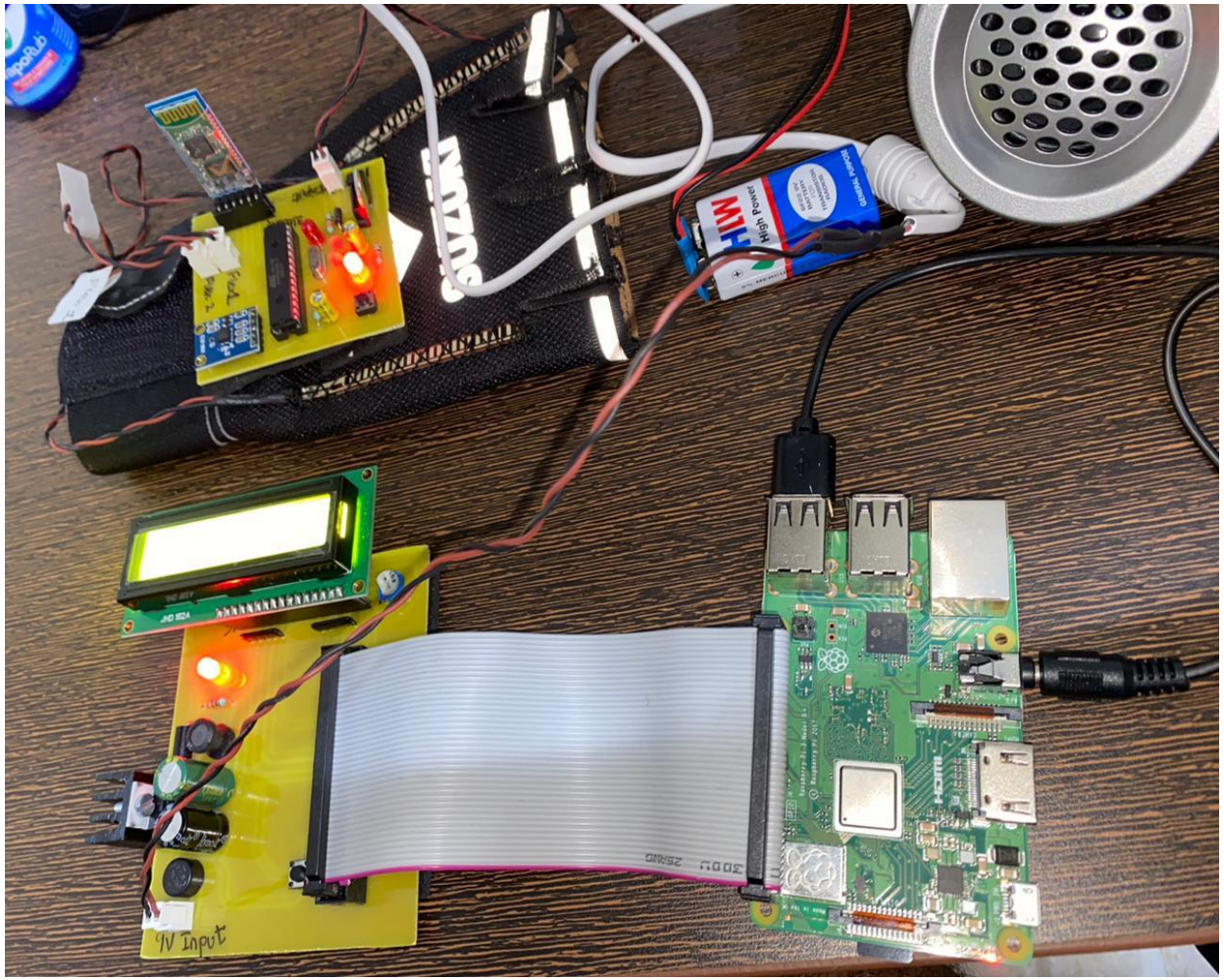
Detailed Description Of The Components Used

***Display Screen With R-pi Connector:**
LCD displays have an optimum viewing angle, and depending on how the screen is mounted it may be necessary to change the orientation of the display to give the best results. By default, the Raspberry Pi Touch Display and Raspberry Pi are set up to work best when viewed from slightly above, for example on a desktop. If viewing from below, you can physically rotate the display, and then tell the system software to compensate by running the screen upside down.

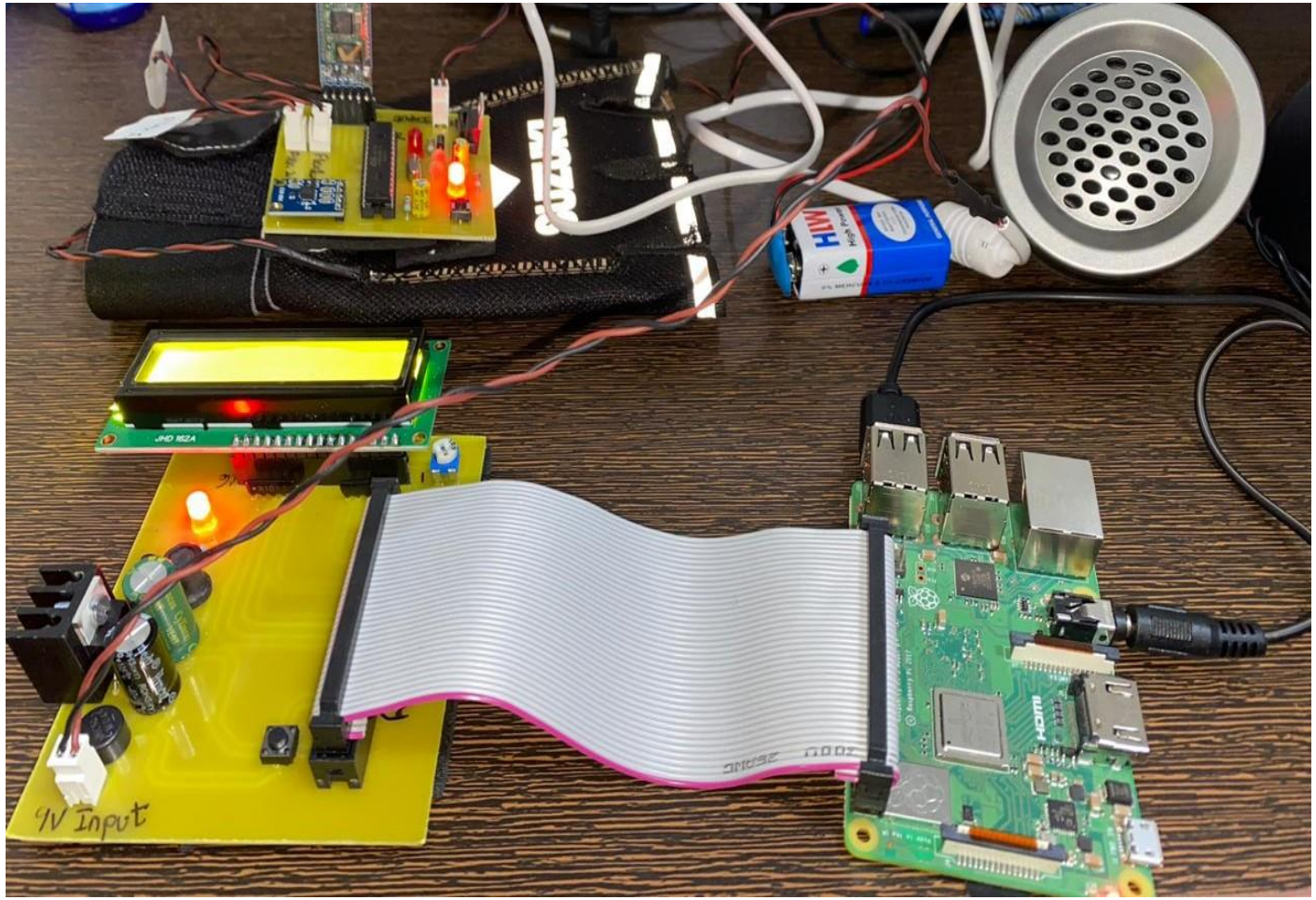
Detailed Description Of The Components Used

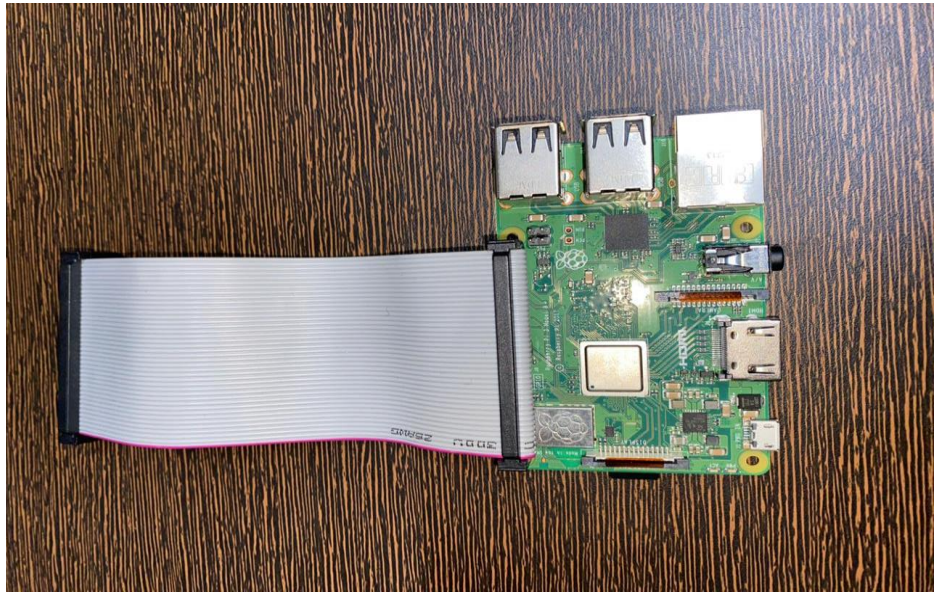
***Connection Of All The Components:**

Recent advancements in technology have provided solutions to the communication of deaf and mute individuals. In this paper, the main objective is to provide easiness of communication and to implement an automatic speaking system for deaf and mute people. Communication is one of the most vital behaviors of a human. Every living being has its way of communication. What would it be like if humans could not talk or listen! The primary purpose of this project is to help people who cannot speak or hear. Since many of us cannot understand sign language, it will help people with disabilities to communicate with us and enable them to share everything. It will play an essential role in healthcare and education. This research study utilizes wearable gloves so that anyone can afford this easily. Four flex sensors, an accelerometer, a speaker module, gloves, an Arduino Uno, an LCD screen, a GSM 800L module, and lithium-ion rechargeable battery are used to develop an intelligent sign language recognition system for dumb people. Three rechargeable batteries were used to charge Arduino Uno, GSM, and speaker module. The sensor converts the detected execution load into a voltage and the Arduino Uno microcontroller detects this voltage. Finally, the detected signs are displayed on the LCD to display and pronounced verbally by the speaker.



Some Pictures Of The Complete Project





Conclusion

Sign language could be an effective method for bridging the gap between the mute and deaf communities and the general public. The aim of this project is to bring the mute community and the rest of the world closer together. The method proposed converts text into speech. The machine assists mute people in overcoming time limitations and improving their overall quality of life. The new structure is more compact and portable than the present scheme. This computer converts the language into a passing voice and display that both blind and elderly people can understand. The language is transformed into a form of text that is projected on a digital display screen to assist mute people. In the real world, this computer is useful for mute people who are unable to communicate with elderly people. This project's gesture recognizer is unique in that it can function independently in a typical living environment . It can also be used for speech impaired and paralyzed patients who are unable to speak, as well as Intelligent Home Applications and industrial applications

Wiring of the Smart Speaking System For Mute People

The connections are as follows-