Engineering Clinics Review-2

PROJECT TITLE- Speech Generation Device For Mute People

Using Raspberry Pi and Python

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Motive Of The Project

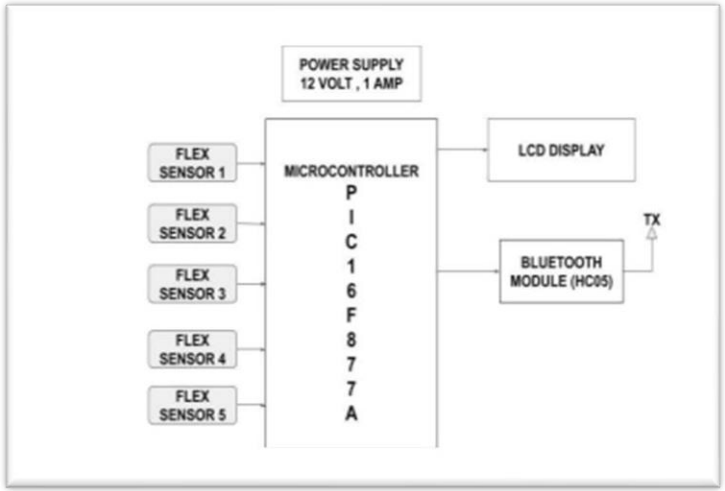
The use of speech and gestures in human communication is thoroughly organized. As a result, we decided to make 'Gesture' the focal point of our project. Computer gesture and sign language identification is the recognition of gestures and sign language.

Here we suggest a smart speech device that allows mute people to express their message to ordinary people by using hand movements and gestures. The system uses a hand motion monitoring system fitted with motion and flex sensors and a speaker unit [1,2]. A microcontroller can be used for data processing and device operation. The device consists of about 10 recorded messages such as ”need help,” ”where is the toilet/washroom” and so on to help mute people communicate simple messages. The machine reads hand gestures of individuals for various variations of hand movements[3,4]. It also comprises of a trigger sensor to signify that the person wishes to enable the device and to speak something. This means that the computer is silent while the person makes involuntary hand movements. The processor of the microcontroller continuously receives input sensors data and then analyses them.

Development Of Speaking System For Mute People Using Hand Gesture

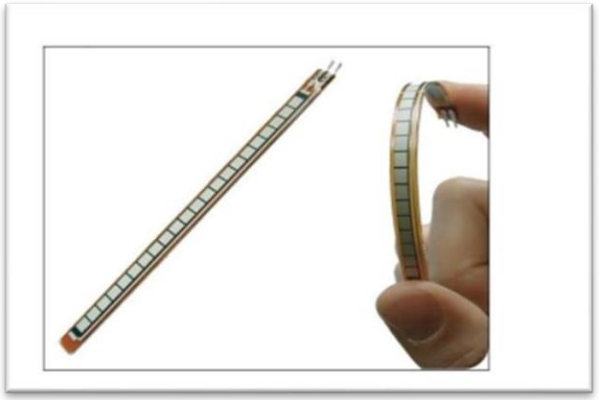
The method used for communication between normal people and mute people can be processed in certain steps. There are five Flex sensors connected to microcontroller, basically flex sensor gives output according to hand gesture or movement of hand in the form of variable resistances, when a bending motion occurs in the flex sensor, the resistance of the flex sensor increases, and this changing resistance is given to the microcontroller. We have programmed the microcontroller with binary codes (0000- 1111)according to the resistance value between straight and bending action of flex sensor, Microcontroller contain some messages in it according to binary values (output of flex sensor),microcontroller compares that output with the stored messages and processes it with respect to resistance of flex sensor. The microcontroller gives this output to LCD and Bluetooth module. Bluetooth module acts transmitter between microcontroller output and speaker.

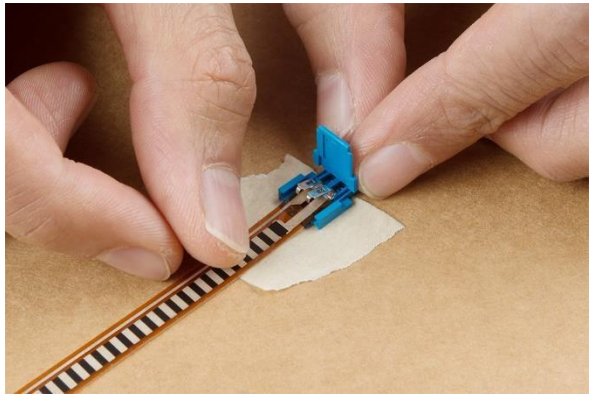
Block Diagram:



2) **Flex sensors :**

A flex sensor, also known as a bending sensor, measures the amount of deflection or bending. Typically, the sensor is fixed to the surface, and bending the surface changes the resistance of the sensor component. It is used as agoniometer and is also known as a flexible potentiometer since the resistance is directly proportional to the bend.





3) **LCD Display :**

Liquid crystal displays are popular in digital watches and a variety of portable computers. A liquid crystal solution is sandwiched between two sheets of Polarising material in LCD displays. The electrical current that flows through the liquid causes the crystals to align, preventing light from passing through as a result, each crystal acts as a shutter, either allowing light to pass through or blocking it. LCDs have become very popular for displaying information in many smart devices in recent years. The utensils. Microcontrollers are commonly used to operate them. They simplify the operation of complex machinery. LCD’s come in a variety of shapes and sizes, but the most popular is a backlit 20-character x 4-line display. It only needs 11 connections: eight data bits (which can be reduced to four ifnecessary) and three control lines (we have only used two here). It takes just 1mA of current and runs on a 5V DC supply. Moving the voltage to pin 3 of the monitors. usuallywith a trim pot, will change the display's contrast.

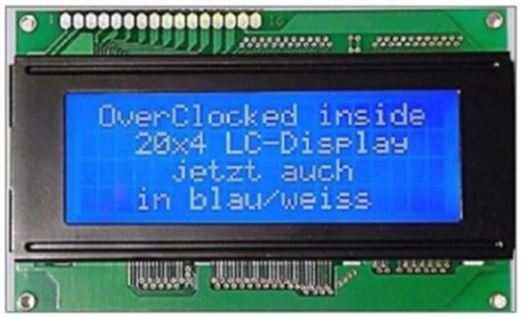


Fig 4.LCD Display

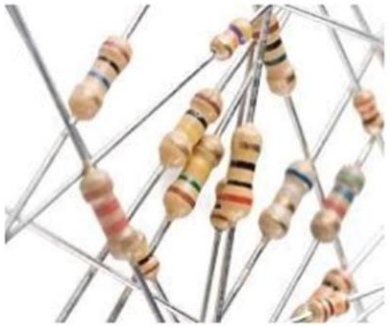
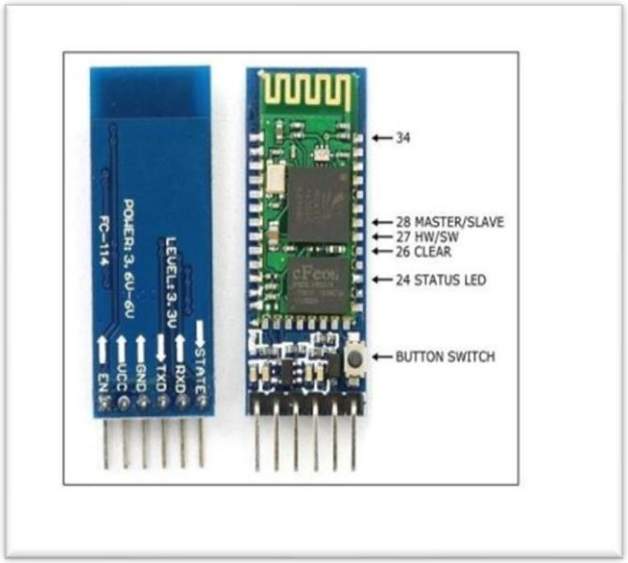


Fig 6.Resistor

4) Bluetooth Module :

The HC-05 Bluetooth module is a MASTER/SLAVE computer. The factory settings are SLAVE by nature. Only AT COMMANDS can trigger the Module Function (Master or Slave). Slave modules are unable to establish a connection with another Bluetooth computer, but they do accept connections. The Master module may establish a link with other devices. It can simply be used to replace a serial port when connecting to another Bluetooth device.



5) IC 7805

The IC 7805 is an integrated circuit for voltage regulators . It is a member of the IC fixed linear voltage regulator sequence 78xx. In IC 7805 a circuit, the voltage source may have variations and would not give the output of the fixed voltage. The voltage regulator IC preserves at a constant value the output voltage. The xx in 78xx displays the fixed output voltage that it is supposed to have. 7805 supplies a controlled power supply of +5V. Depending on the respective voltage levels, condensers with appropriate values may be attached to the input and output pins.

6) Resistors :

A resistor is a passive electrical two-terminal component that as a circuit element implements electrical resistance. Resistors are used, among other applications, in electronic circuits to decrease current flow, change signal levels, separate voltages, bias active components, and terminate transmission lines.

Result:

CONCLUSION :

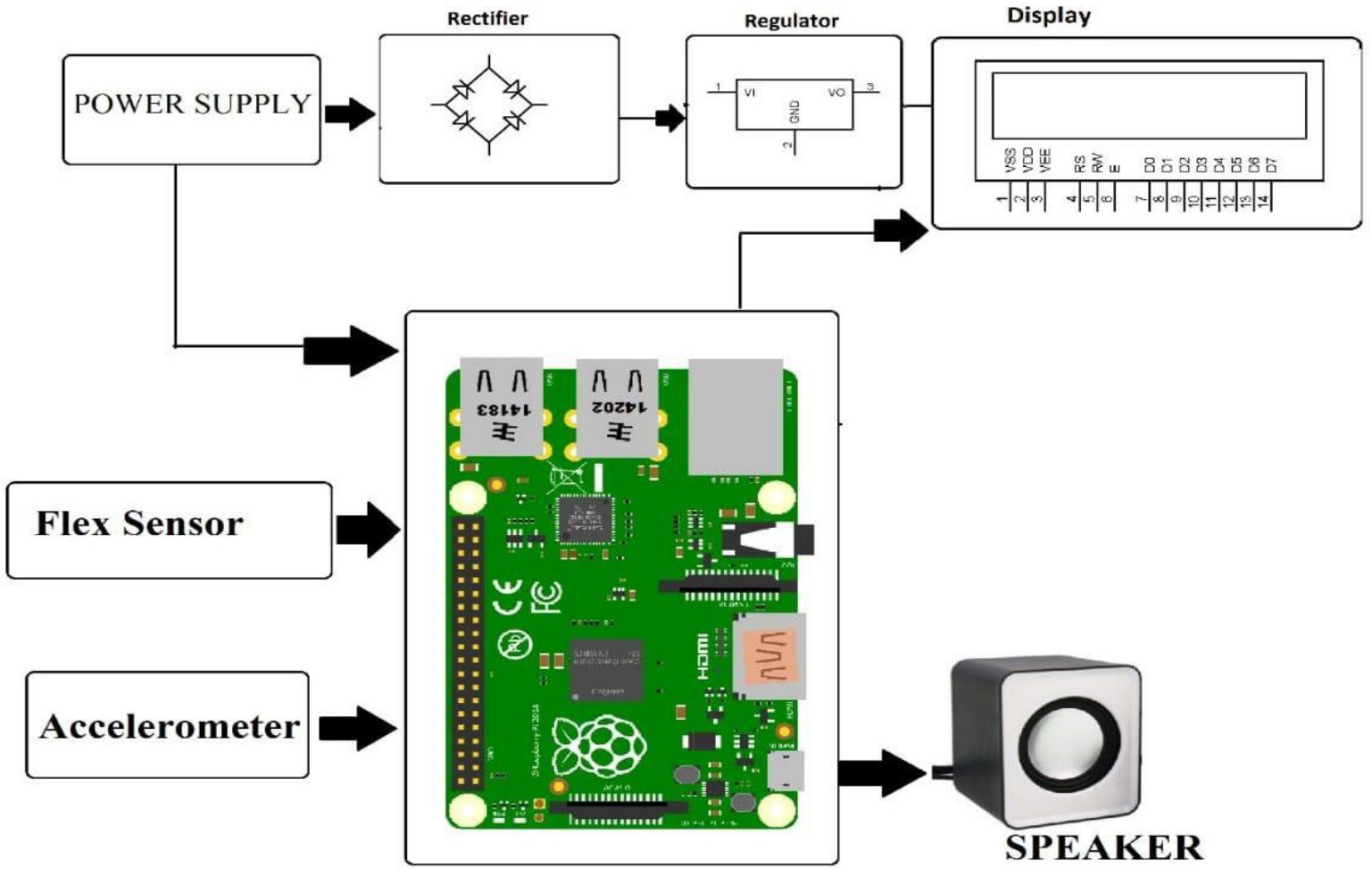
Sign language could be an effective method for bridging the gap between the mute and deaf communities and the general public. The aim of this project is to bring the mute community and the rest of the world closer together. The method proposed converts text into speech. The machine assists mute people 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

TIMELINE OF PROGRESS

Action	Timeline
Phase – 1	26-June-2023 to 1st-July-2023
Phase – 2	17-July-2023 to 22-July-2023
Phase – 3	07-Aug-2023 to 12-Aug-2023

Wiring of the Smart Speech Generation Device For Mute People

The connections are as follows-



THANK YOU