Development Of Speaking System For Mute People Using Hand Gesture

R. P. Borase Department of Instrumentation Engineering Ramrao Adik Institute of Technology, Navi Mumbairakesh.borse@rait.ac.in

Abstract— It is very difficult for voice impaired people to communicate their messages to regular people because regular people are not educated. Hand sign language, contact is becoming very difficult. Therefore, I suggest a speech device that will make it possible for stupid and mute people to convey their messages to normal people through hand gestures.

The proposed method, the use of hand gesture reading system fitted with gestures and flex sensors linked to each finger and Linked as input to the RF Transmitter along with the speaker unit. This machine is operated by a battery-powered circuitry. Just run it. Also, this device will include various terms and phrases that will help mute people send simple messages. This is the Device reads the hand gesture of a stupid person for various differences in the movement of the hand. The processor is continuously receiving input Sensor values and then process them, then look for a corresponding message for a set of sensor values. Once it has been found in memory, an interfaced speaker retrieves the message and speaks it using text for speech processing This study's data was given. The data was gathered using structured open and closed questionnaires that were only provided to the participants in my study. Data: Data The study was conducted using MP Lab software. Finally, the results have been positive for my research goals and have been Planned to be Support the target group in the business.

Keywords—Flex Sensor**,** IC Microcontroller, LCD Display 16*2, Resistor, Bluetooth module, IC7805

I. INTRODUCTION

It is very difficult for mute people to communicate their message to the general public. Communication becomes very difficult because most people are not trained in hand sign language. In an emergency or other circumstance, when a mute person traveling or interacting with or conveying a message to new people becomes very difficult. 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. Now searches for compatible messages for a range of sensor data. Once located in memory, these messages are

recovered and spoken using text for speaker identification via a communicated speaker. Thus, we have a fully functioning smartphone system that helps mute people interact with regular people using a simple, wearable system.

II. LITERATURE SURVEY

In the previous chapter we saw a brief detail about thehardware of the project and also the control requirements of it [3,7,8]. In this paper we'll see the literature behind why Development of speaking system for mute using microcontroller and also research and international journals that provide a strong foundation for our project.

Literature

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 languageidentification is the recognition of gestures and sign language.

III. METHODOLOGY

A. Block diagram and implementation

In this paper, the method used forcommunication 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[5,6]. 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 (cell phone)[7].
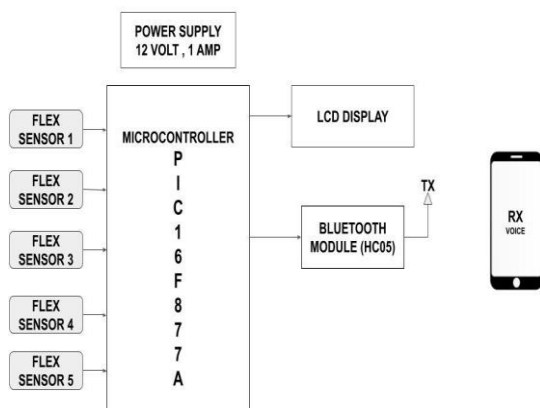

Fig 1. Block diagram

B. Software-Hardware Specific Requirements:

1) PIC Microcontroller

The word PIC stands for Peripheral Device Controller. It is the offspring of the brain. Technology for Microchips, USA. This was originally designed as a supporting system for the control of its peripheral devices by PDP computers, and hence called as PIC, Peripheral Interface Controller. To classify their single chip micro controllers, they have coined this name. Now, in industrial automation and embedded applications, etc., these 8-bit micro controllers have become quite significant. PIC16C6x/7x is one of the earlier models of PIC Microcontrollers. There is an increase in the Analog to Digital converter capabilities of the 7x family. A number of capabilities bundled in both dual in-line (DIP) and surface mount packages are available for these cs. These are available in a surface mount kit of 28 pins DIP, 40 pins DIP, 44 pins... etc. Any of the PIC controllers are numbered with the letter A. The appearance of A indicates the brown-out reset function, which causes the PIC to reset when the power supply voltage drops below 4.0v.

Fig2.PIC Microcontroller

2) Flex sensor

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.
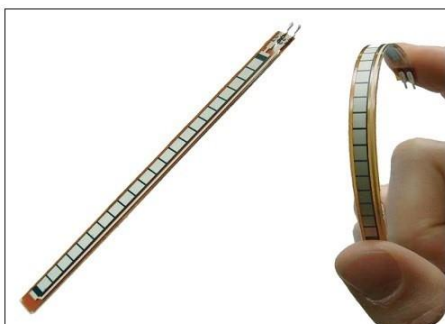

Fig 3.Flex Sensor

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.
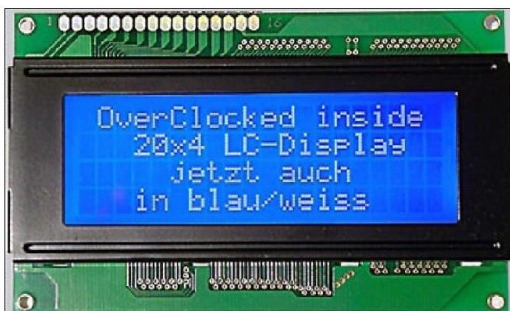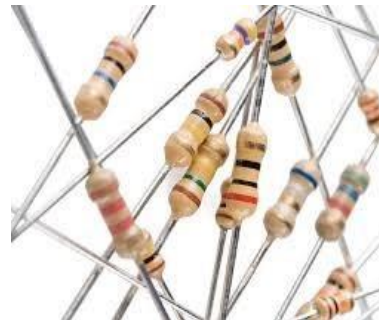

Fig 4.LCD Display

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 (Masteror 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.
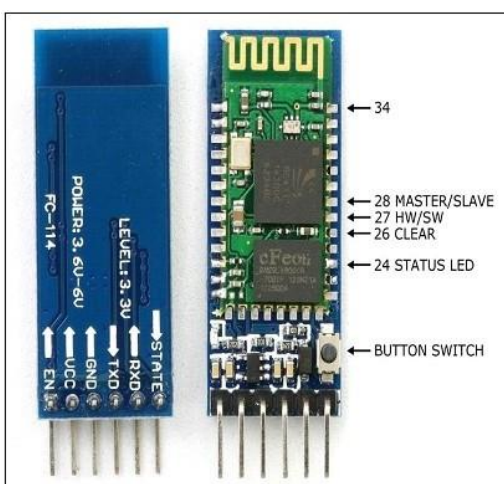

Fig 5.Bluetooth Module

5765 / **R. P. Borase   Development Of Speaking System For Mute PeopleUsing Hand Gesture**

6) IC 7805

The IC 7805 is an integrated circuit for voltage regulators.It is a member of the IC fixed linear voltage regulatorsequence 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.

Fig.7.IC 7805

5) Resistor

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

Software Requirements 7) Software development

Microchip Technology's MP LAB IDE is a proprietary integrated freeware development framework for the development of PIC and ds PIC microcontroller embedded applications. MP LAB is designed to work with MP LAB- certified computers, such as MP LAB ICD 3 and MP LAB REAL ICE, to program and debug PIC microcontrollers using a personal computer. MPLAB provides PICK programmers as well. MP LAB X supports automatic code development with the MP LAB Code Configurations and MP LAB Harmony Configuration plugins. MPLAB X is themost recent iteration of the MPLAB IDE, which was

created by Microchip Technology and is based on the open-source NetBeans platform. For editing, debugging, and programming, MPLAB X supports Microchip's 8-bit, 16- bit, and 32-bit PIC microcontrollers. MPLAB X is the first version of the IDE to provide cross-platform support for macOS and Linux operating systems in addition to Microsoft Windows.
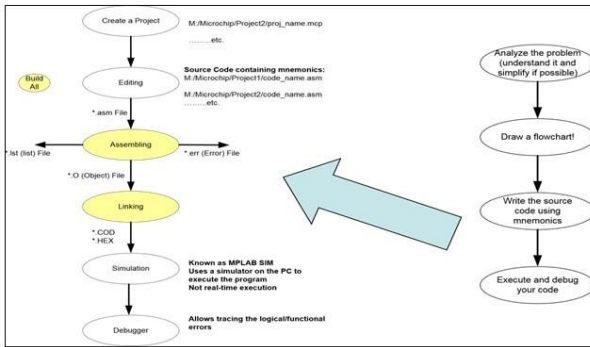
Fig 8.Matlab

Result:

_C._ **Implementation Methodology**

In this paper, 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 a flex sensor produces variable resistances in response to a hand gesture or movement.

When a bending motion occurs in the flex sensor, the resistance of the flex sensor increases, and this changing resistance is sent 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 (cell phone).

-

Binary value	Instruction
0000	Hello
0001	My name is
0010	I stay in
0011	Welcome
0100	I need Doctor
0101	could you help me to cross the road
0110	What is time
0111	Please give me a glass of water
1000	Can you help me to find my glass
1001	Can you take me to this address
1010	Could you please guide me
1011	I need your help
1100	I am doing well
1101	Please give me a medicine
1110	could you read this for me
1111	Thank you

Experimental result

IV. CONCLUSION

Sign language could be an effective method forbridging 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 mutepeople in overcoming time limitations and improving their overall quality of life. The new structure is more compact and portable than the present scheme. Thiscomputer converts the language into a passing voiceand 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 paralysed patients who are unable to speak, as well as Intelligent Home Applications andindustrial applications

OUTPUT
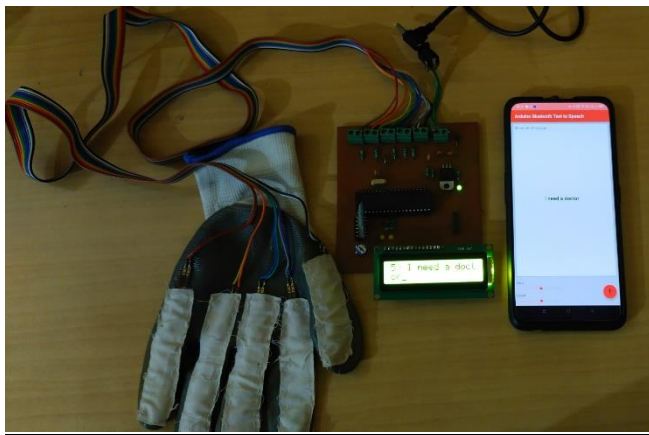
REFERENCE

[1] Amarjot S. Devinder K. Phani S. Shrikrishna K. and Niraj A.,” An Intelligent Multi Gesture Spotting Robot to Assist Persons with Disabilities.” international journalof computer theory and Engineering. VOL.4, NO.6, PP,1290- 1420,2012.

[2] Alois, F., Stefan, R., Clemens, H., and Martin, R.” Orientation Sensing for Gesture-Based Interaction with Smart Artefact's.” IEEE Transaction on audio, speech, and language processing.” Vol.28, No.8, pp.1434-1520,2007.

[3] Donglin, W., Ajeesh, P., Hye, K., and Hosub, P.” A Deconvolutive Neural Network for Speech

Classification with Application to Home Service Robot." IEEE Transaction on Instrumentation and Measurement.Vol.59. No.12, PP.2334- 4620,2010.

[4] Istvan, I., Zoran, M., Nikola, D." Hands-Free Voice Communication with TV", IEEE Transactions on consumerelectronics, Vol.17, No.2, PP.1378-1695,2011.

[5] Kekre, M., and Vaishali, M.," Speaker Identifications by Using Vector Quantization," IEEE Transactions on Mechatron- ics, VOL.15, NO.1. PP.1034-1620.2010.

[6] Jean, C., and Peter, B." Recognition of Arm Gestures Using Multiple Orientation Sensor: Gestures Classification", IEEE Intelligent Transport-tationSystems Conference on Electronics, Vol.13, No.1,pp.334-520,2004.

[6] Joyeeta, S., and Karen, D.," Indian Sign Language Recognition Using Eigen Value Weighted Eucliden Distance Based Classification Tech-nique", International journalof advanced computer science andapplications, Vol.4, No.2, pp.434-820,2013.

[7] Ravikiran J., Kavi M., Suhas M., Sudheender, and S, Nitin V." Fin-ger Detection for Sign Language Recognition", Proceeding of the In-terntional multi conference of engineering and computer scientists, Vol. 2, No. 1, pp.234- 520,2009.

[8] V. Padmanabhan, M. Sornalatha. "Hand gesture recogni- tion and voice conversion system for dumbpeople" Inter- national Journal of Scientific EngineeringResearch, Volume 5, Issue 5, May-2014 427 ISSN 2229-5518.