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Gesture Control Smart System for Deaf and Dumb People

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ABSTRACT: Deaf and dumb people communications with others are only using the motion of their hands and their expressions. We proposed a new technique called artificial speaking mouth for dumb people. It will be very helpful to them for conveying their thoughts to others. Some people are easily able to get the information from their motions. This system is based on the MEMS SENSOR. According to dumb people for every motion they have a meaning. That message is kept in a data base. Likewise all templates are get in a data base. In real time the template data base is fed into MC and the MEMS SENSOR is fixed in their hand. For every action the MEMS SENSOR get accelerated and give the signal to the MC. The MC matches the motion with the data base and produces a speech signal. The output of the system is using the speaker. By properly updating the data base the dumb will speak like a normal person using the artificial mouth. The system also includes a text to speech conversion (TTS) block that interprets the matched gestures.

KEYWORDS: Hand gesture, gesture recognition, MEMS SENSOR, Speech to text conversion, Hand gesture to voice conversion, deaf and dumb people.

I.INTRODUCTION

Nowadays we always hear about new technology that improves our lifestyle, that makes our life easier. Technology has revolutionized the human mankind. Human race has put a gear in technology and they are not in a mood to move the pedals away from this gear. There is huge research on various technology sector such as Artificial Intelligence, Smart phones and many more. This research lead to new inventions and making one's life easier. But there has been a very less research for Deaf and Dumb people. This topic has get less attention as compared to other sectors. The Main challenges that this special person facing is the communication gap between -special person and normal person. Deaf and Dumb people always find difficulties to communicate with normal person. This huge challenge makes them uncomfortable and they feel discriminated in society.

Because of miss communication Deaf and Dumb people feel not to communicate and hence they never able to express their feelings. Gesture control smart system (GCSS) localizes and track the hand gesture of the deaf and dumb people in order to maintain a communication channel with the other people. The aim of this project is to develop a system that can converts the text into speech and vice versa. The focus of the project is to place the templates in the data base and with the data base that matching the templates that has been stored in the MC. The method gives output in text format that helps to reduce the communication gap between deaf mute people and normal people.

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II.SYSTEM MODEL AND ASSUMPTIONS

The method used here is to detect the gesture motion of the deaf and dumb people by the acceleration of the values of the plates in the MEMS SENSOR which is get attached with X , Y and Z plates in it. These values may get varied according to the motion of the deaf and dumb people with whom we want to get interacted. These values of the plates will get matched with gesture motion of deaf and dumb people along the values which is already get stored in the micro controller. The gloves with the MEMS SENSOR is get attached with the hand of the deaf and dumb people. The gloves contains the MEMS SENSOR , micro controller and the Bluetooth devices which has been connected to the LCD device of the people. These entire system is get interfered with the smart system with the normal people which has the output as voice message. The smart system has been connected with the Bluetooth device via this Bluetooth connection in this system. The application has to be get created for this further communication which has shows the output in smart system. The voice is get converted into the text message which will helps the deaf and dumb people to read and reply to the normal people.

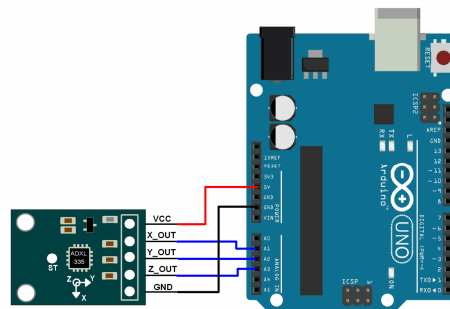


Fig.1 Arduino board with MEMS sensor

Text is generated based on acceleration values on the MC. Based on the motion given by the deaf and dumb people the values get changed in the X , Y & Z plates and the speech is get heard in the smart system via speaker.

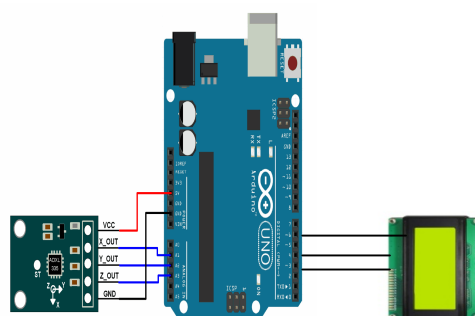


Fig. 2 Arduino board & MEMS sensor with LCD system

Text transmitted through the bluetooth device in the LCD system. These LCD system is get connected with the smart system with the Bluetooth in the MC. The speech is get converted into the text message and get displayed in this LCD display.

- arduino
- mems sensor-MPU 6050
- LCD Display 16*2 -- HC-05 BLUETOOTH

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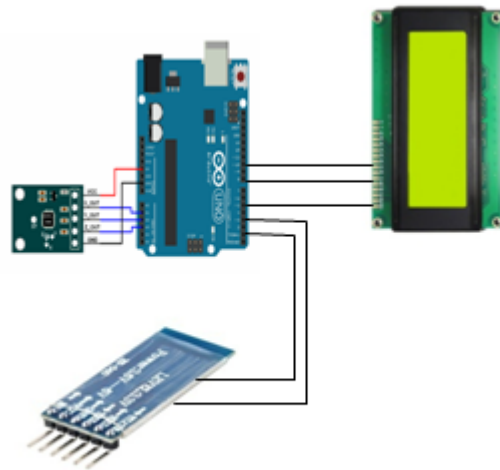


Fig. 3 Bluetooth is connected with the MC

Transmitted data is received by android app in the smart system by using the Bluetooth connection with the Micro Controller. By connecting the Bluetooth with the system Bluetooth these entire connection is get ineterfered with the smart system and get the output as the voice message.

III. BLOCK DIAGRAM

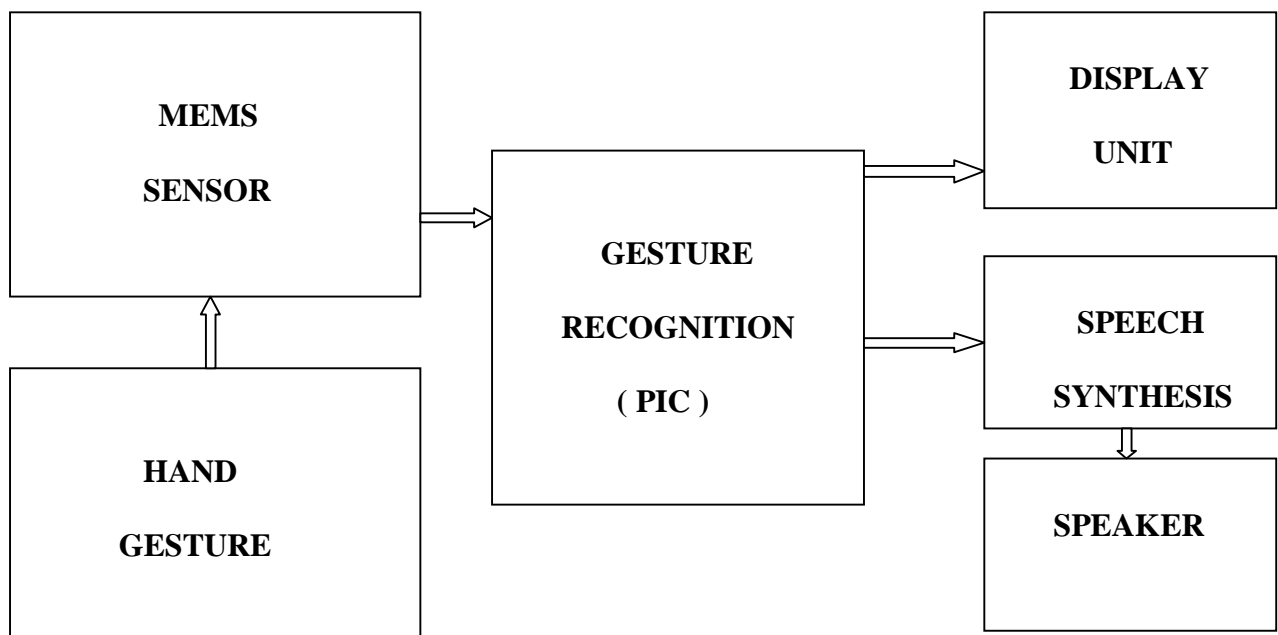


Fig.4 Block diagram representation.



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The output from gesture control is the modern technique of the motion from the deaf and dumb people which has been get matched with the X, Y & Z values in the MEMS SENSOR. Then the result from the sensor will get entered into the arduino board to match the values and to determine the motion control. The voice message from the normal people will get converted into the text message for the shake of the deaf and dumb people and get recognised by them by using the display system in their hand by which it get attached with their hands.

The deaf and dumb people will move their hands according to the values which is get stored already in the controller board and the result is get as the speech using the speaker in the smart system which is get connected via Bluetooth with the controller. Hence the output for the deaf and dumb people will received as the text format and for the normal people the output is received as the voice message. By this process the communication between the deaf and dumb people and the normal people will held.

IV. DESCRIPTION

MEMS sensor is used to sense the templates in order to make the detection by changing in the acceleration in the sensors. This output is get entered into the PIC controller which is the ARDUINO. The MEMS sensor will operate only after the hand gesture by the dump people. In order to get output in the display unit only by the result of the controller. The speech will get synthesized in the smart system after the deaf mute people will reply using their gesture procedure. Gesture is nothing but the smart technique to communicate with the normal people by the deaf and dumb people. This speech is get deliver in the smart system via speaker in the smart phone. Hence this project will get exposed by this way of output.

MICRO CONTROLLER :

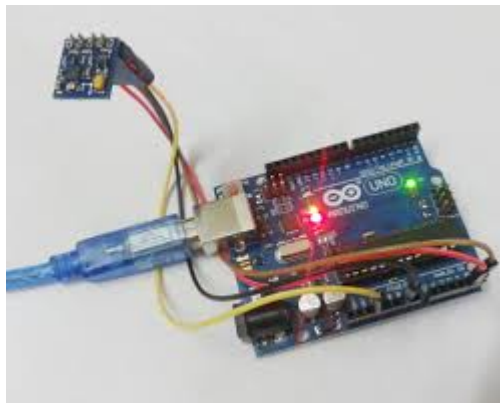


Fig. 5 Micro controller with sensor connection

The micro controller is the ARDUINO UNO R3 is used here. The values of the X, Y & Z plates are get stored in this board of ARDUINO. The MEMS SENSOR is get connected with the board there by the gesture motion given by the deaf and dumb people is sensed by the sensor and get the output as the voice message to the normal people and text message is given to the deaf and dumb people.

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MC WITH BLUETOOTH :

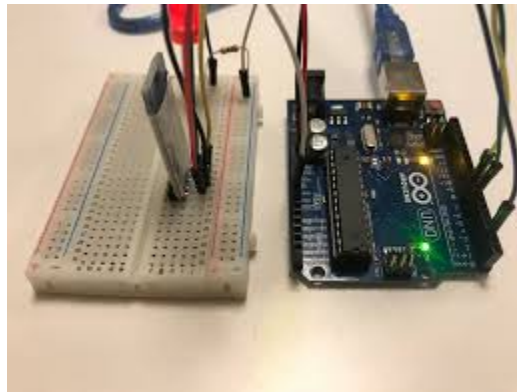


Fig. 6 Arduino board with bread board

The arduino board with the Bluetooth device has to be get connected together in order to connect with the smart system Bluetooth folder. This will make the connection between the arduino board and the smart system. The voice message from the normal people will get converted into the text message that will helps the deaf and dumb people to interact with the normal people. The output from the Bluetooth device is revealed as the displayed output in the LCD display.

LCD DISPLAY :

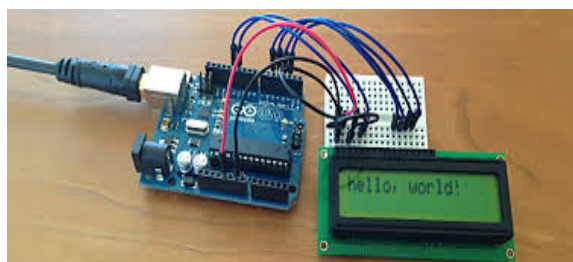


Fig. 7 Board with LCD display

LCD display is connected with the entire connected system with the arduino board. The voice message from the smart system by the normal people is get converted into th text message and get displayed in this LCD display. The application is get derived in the smart system by using the general ideas there by getting the voice message in the smart system.

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VI. RESULT & CONCLUSION

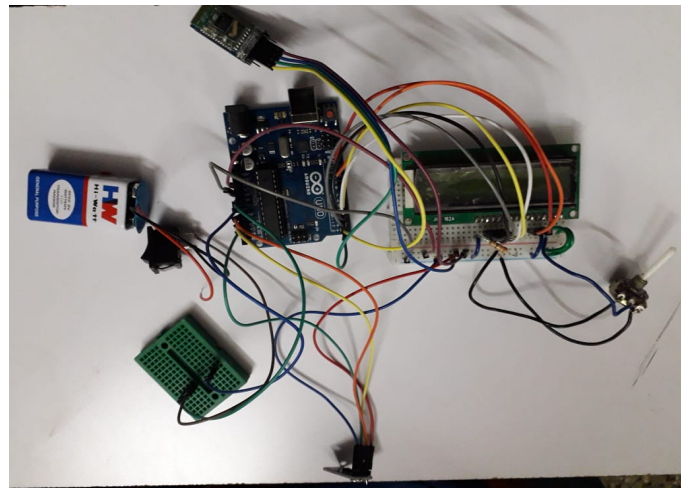


Fig. 8 Entire connection of the gesture system

Sign language being the only communication means for deaf-dumb community hampers their interaction with the normal people who lack the knowledge of sign language. This paper has the potential of minimizing this communication barrier by working as an automated translator and converting sign language directly into vocal and textual format for the understanding of normal people using various MEMS sensor, PIC microcontroller. The input data glove detects the hand gesture done by the deaf-dumb person wearing it and provides the analog input to the microcontroller for further interpretation according to the database and the final output is observed on the LCD display and the speaker. Thus, hand gesture can be automatically converted with the help of this system into understandable form for the normal person.

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