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SPEAKING SYSTEM FOR MUTE PEOPLE USING HAND GESTURE

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ABSTRACT

The hardware components of the proposed device consists of input sensors (an accelerometer and five (5) flex sensors) and the output display (an LCD and a speaker). An Arduino Mega microcontroller is used to process the data from all sensors. As shown in the figure, the input values from flex sensors and accelerometer are conveyed to the Arduino Mega, where these values are used in a gesture recognition algorithm to translate any gestures. However, the gesture recognition algorithm will not be described in this article. The results of translation are processed and the output result will be displayed simultaneously on an LCD as well as through audio speech using a speaker. An Arduino UNO receives and processes input signals from sensors, and then, provides the commands to the output component. The board contains 16 analogue input pins which is sufficient to handle a total of eight (8) analogue input from flex sensors and accelerometer. Furthermore, the device is also installed with an LCD to display the result of translation through text. The LCD requires six (6) analogue pins to be connected to the Arduino's analogue pins. An audio speaker is also used in this device to produce the appropriate speech for any sign language. The speaker is connected to an analogue pins on the Arduino boards. Therefore, the device requires 6 analogue pins on the Arduino board, where Arduino Mega is more than enough to handle all the required pins

I. INTRODUCTION

Sign languages have been used since three centuries ago by humans as a medium to deliver message and communication, especially for the deaf communities. New sign languages emerge throughout the world where deaf communities exist. Sign languages can consist of hand shapes, movement of the hands, body, and facial expressions to express a speaker's thoughts. However, there are not many normal people understand sign language. Therefore, as the results of tremendous evolution of technology, hearing aid devices have been introduced to help deaf communities to communicate with others or hear others. Hearing aid devices would help for those who didn't lost their sense of hearing completely, while the group of people who have hearing impairment can just depend on sign language to communicate between each other. There are various types of off-the-shelf hearing aid devices which include behind-the-ear, in-there and canal aid to help deafness and other communication disorder. Although hearing aid devices are helpful, user might experience problems such as uncomfortable feeling and hearing background noise with this kind of device. Therefore, researchers have been developing various methods that can translate sign language gestures.

Basically, there are two known methods: vision-based system and wearable devices. Vision-based systems utilize image processing method by feature extraction techniques to identify hand and fingers movements. There are many other studies on sign language translation using vision-based system explained in. The advantage of vision-based systems is that the systems may not require the users to be attached with sensory devices that can be messy and uncomfortable. However, the vision- based systems are difficult to develop because it require complex and extensive computations in developing algorithms for feature and movement recognition.

II. LITERATURE REVIEW

[1] The goal of this research is to develop an electronic speaking system to assist speech-impaired people. This system's main control unit is an Arduino. Arduino was designed in such a way that configuration settings can be easily changed without requiring a complete rewrite of the programme code. There are two ways to communicate with this electronic speaking system. The first is audio from the speaker, and the second is a text command displayed on the LCD. A glove with flex sensors is being used to make gestures. The recorded voice commands are initially saved to the SD card. There is a separate audio and text command for each gesture. to boost the audio

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[2] Gesturing is a natural means of communicating a specific idea or intention. The use of a wearable hand glove to interpret sign language is proposed in this research. To distinguish the characters in the American Sign Language alphabet, this wearable device uses five flex-sensors, two pressure sensors, and a three-axis inertial motion sensor. A wearable device containing a sensor module, a processor module, and a display unit mobile application module make up the entire system. Android-based smartphones have a text-to-voice feature that turns received text into auditory output.

[3] The planned technology will recognise Indian Sign Language and convert it to speech and text in English and Malayalam, which will then be shown on an Android phone.

[4] The goal of this project is to create a system for recognising sign language that allows people with speech impairments and normal people to communicate, thus closing the communication gap. Hand gestures are significant because they represent the user's opinions in less time than other motions (arm, face, head, and body). A flex sensor-based gesture recognition module is being constructed in the current effort to detect English alphabets and a few sentences, and a Text-to-Speech synthesiser based on HMM is being designed to convert the relevant text.

[5] The goal of this study is to show the visual recognition of static or dynamic movements from visual pictures on a 2D image plane, without the use of any external devices. Gestures were detected using a task-specific state transition based on genuine human articulation.

[6] Communication is primary means of sharing information. For the deaf and dumb, sign language is their means of sharing information. A lay man finds sign language hard to decipher. Hence we propose a hand glove with combination of flex and three axis accelerometer sensors which is to be worn by the deaf and dumb while communicating with the rest of the world. The data collected using the sensors are matched with predetermined values using the technique of template matching using ARM LPC2148. The data that is accessed is then sent to an android app using a wifi module. Here in this system we focus on ASL alphabets. The data that is sent to the Android app is displayed on the screen and a voice output for each character is played.

III. PROPOSED SYSTEM

Our project is to simplify the task and developed using flex sensor which is more flexible and accurate for measuring hand gesture. The device will even have the ability to unravel greater motions that require single hand development. For each hand motion made, an indication is shaped by the sensors appreciate the hand sign the controller coordinates the motion with pre- stored inputs. The microcontroller is a low power gadget which perceives motion performed by the client. The hardware components of the proposed device consists of input sensors.

(5) flex sensors and the output as speaker. An Arduino UNO microcontroller is used to process the data from all sensors. As shown, the input values from flex sensors and accelerometer are conveyed to the Arduino Mega, where these values are used in a gesture recognition algorithm to translate any gestures. However, the gesture recognition algorithm will not be described in this article. The results of translation are processed and the output result will be simultaneously sent through audio speech using a speaker.An audio speaker is used in this work to produce the audio speech which corresponds to a sign language. The 0.5 W speaker is used due to its low power consumption and optimum frequency range.

IV. EXISTING SYSTEM

Indicator. Since various motions experience diverse spatial ways and cause unmistakable multipath impacts, subsequently, stage profiles of signals vary from each other. Signal acknowledgment has risen as of late as a promising application in our every day lives. Inferable from a minimal effort, pervasive In Existing System, when movements are performed before marks passed on in a circumstance, the multipath of each name's flag expansion will be changed nearby hand improvements, which can be received by the RFID arrange information. Second, RFID stage data is shown to be more powerful to natural impedance, labeled items' properties, and furthermore label introductions, contrasted and Received Signal Strength accessibility, and basic effortlessness, RFID might turn into a well-known innovation for motion acknowledgment.

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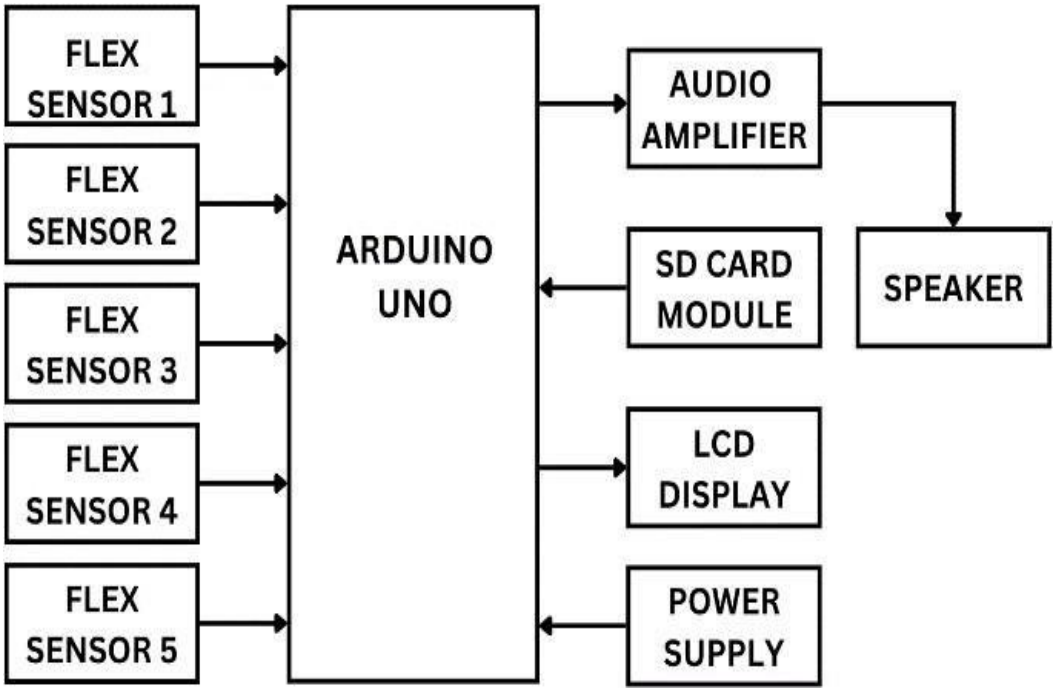
V. METHODOLOGY

The device will even have the ability to unravel greater motions that require single hand development. For each hand motion made, an indication is shaped by the sensors appreciate the hand sign the controller coordinates the motion with pre-stored inputs. The microcontroller is a low power gadget which perceives motion performed by the client. The hardware components of the proposed device consists of input sensors 5 flex sensors and the output as speaker. An Arduino Mega microcontroller is used to process the data from all sensors. As shown, the input values from flex sensors and accelerometer are conveyed to the Arduino Mega, where these values are used in a gesture recognition algorithm to translate any gestures. However, the gesture recognition algorithm will not be described in this article. The results of translation are processed and the output result will be simultaneously sent through audio speech using a speaker.An audio speaker is used in this work to produce the audio speech which corresponds to a sign language.

A. COMPONENTS REQUIRED

1) Arduino UNO
2) Flex Sensor
3) Gloves
4) Speaker
5) 16x2 LCD Display
6) Resistors
7) Cables and Connectors
8) Switch
9) I2C module
10) SD card Module
11) 4GB Memory Card
12) PAM8304 Amplifier Module

B. BLOCK DIAGRAM



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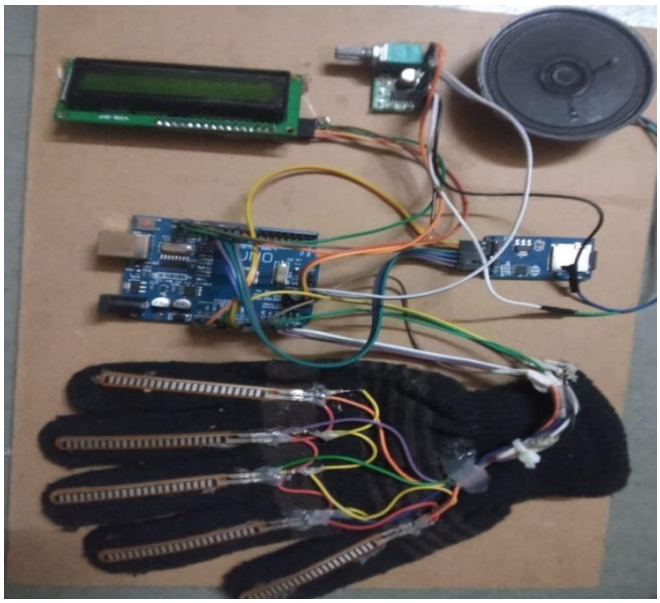
VI. WORKING AND RESULT



Hand Gesture	Message
	Thank You
	I WANT FOOD
	GIVE ME MEDICINE
	I NEED HELP
	WASHROOM

VII. FUTURE SCOPE

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 places when compared to existing systems. To help the mute people, the language gets converted into text kind and on the digital display screen it will be displayed. Who cannot communicate with normal people i.e., deaf and dumb people the system is very much helpful? The primary feature of the project is the one which will be applied in common places that the recognizer of the gestures may be a standalone system.

VIII. CONCLUSION

In this project, arduino based sign to speech conversion system converts sign language into sound with the help of micro- controller board, flex sensors, audio amplifier module, connecting wires and resistances. The sign language is converted into sound output that reduces the communication gap between normal and deaf-mute people. the design of a glove-based sign language translator device. The developed device is able to read the movements of every fingers, five unit of flex sensors. As a final remark, the progress made in the development of the glove prototype. finished product, it shows that using a glove outfitted with sensors, a microcontroller, and wireless communications can be used to translate signs. It satisfies all of the major requirements, and it may lead to further developments in translation devices. With increased attention to the challenge of sign language translation, by this technology the communication gap between sign language users and the hearing may soon be diminished. The completion of this prototype suggests that sensor gloves can be used for practical sign language recognition. More sensor can be employed to recognize full sign language.

IX. REFERENCE

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