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SIGN LANGUAGE TO SPEECH CONVERTER

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ABSTRACT:

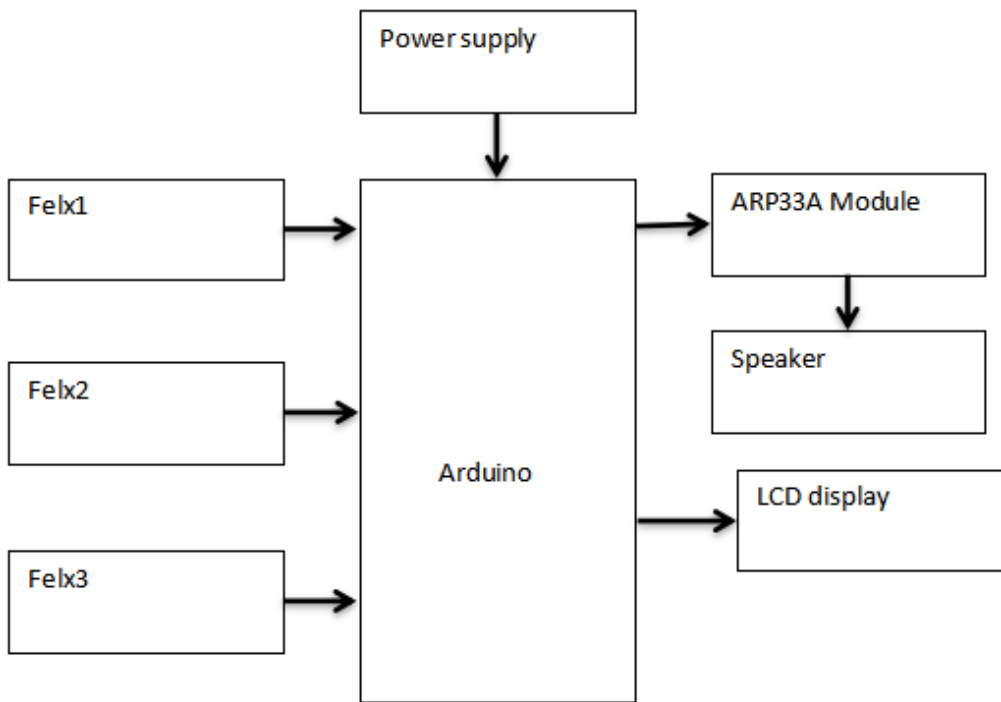
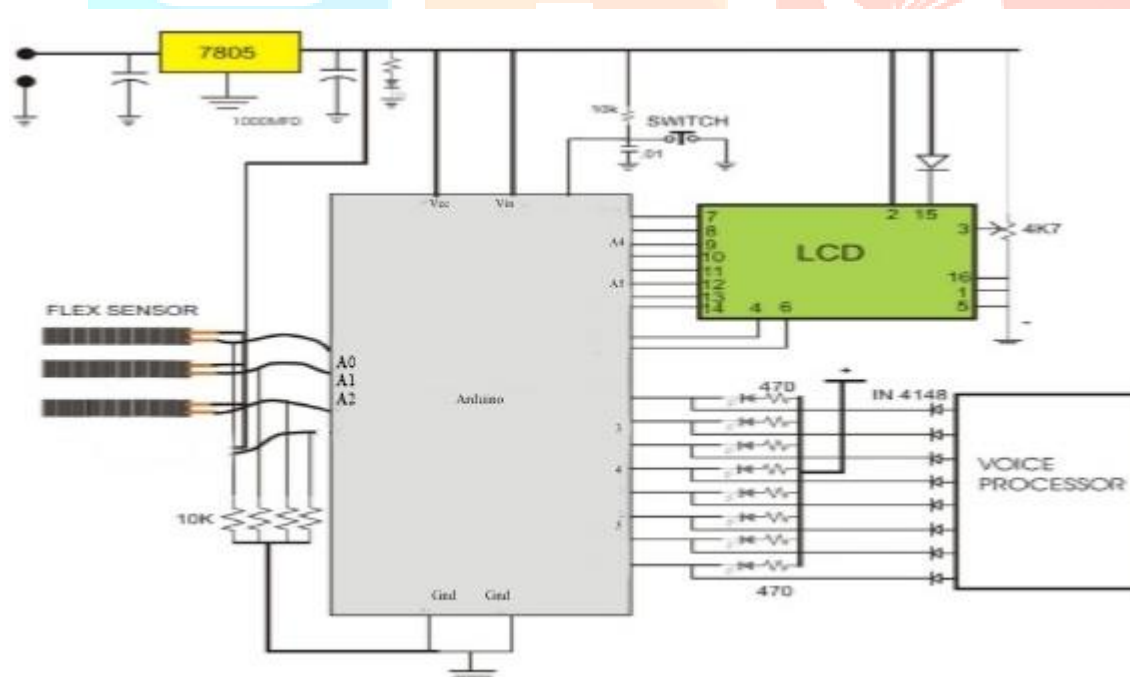
A huge population in India alone is of the dumb and deaf people. So the system is working on a glove based device which will be used for conversion of sign language (ASL) to speech. The basic system consists of a two parts; sign language recognition and conversion to text and further to speech. The sign language glove consist of a simple hand gloves fitted with flex sensors which is being used for the monitoring the amount of bend on the fingers. Flex means bend, this is the sensors that change the resistance depending on the amount of bend on the sensor. Data from the sensors is send to the Control unit which is the Arduino UNO the analog signals from the sensors are digitally converted and compared with the stored value for the recognition of sign and then displayed as a text on the 16x2 LCD and also gives a voice output via ARP33 module which stores the predefined voice inputs .

LITERATURE RESEARCH

A study In the character of the language system, there are two well-known approaches: image processing, and the processing of your data. The image-processing technology with the help of a digital camera for capturing images or videos. To analyze the static image data, and image recognition algorithms, as well as to produce the suggestions on the display of a sign language recognition system which is based on the company's vision, in principle, the Hidden Markov mode (that is, XM) algorithms, artificial neural networks (ANN), and the sum of Absolute differences (SAD) algorithm, which is used to load the image and to eliminate unwanted background noise.

The main drawback of the Vision, a sign language-based detection system is the image acquisition process, many of the environmental problems, such as the camera, location information, and lightning detection. The space in front of the camera to focus on a pair of glasses to capture the most realistic movements of the hand, a higher-resolution camera that will take a longer time to compute, and requires more memory space. The user must have a camera and will to eternity, and may not realize that in a crowded place. An alternative approach to the investigation is a sign language recognition system using glove information . The resulting data from each of the sensors depends on the finger flexion, and a computer analysis of the data from the sensors using static data in order to produce a suggestion). It uses a neural network to improve system performance. The main advantage of this approach is to spend less time and be more responsive in real-time applications. The mobile device and the device, the price is too low.

An alternative approach is the use of a Portable Accelerometer (ACC) and the Surface area of the Electric to My Grams (SEMG) sensors that can be used for hand gesture detection. ACC is designed to provide information on the shoulder, and arm movement. An EMG sensor, which ensures the various movements of the character. The sensor outputs are fed into the computer for processing, and the hand-gesture recognition, and voice/text to build. However, none of the above methods provide users with a more natural user interaction. This proposed system will have to be able to hold a conversation without using a worn-out unit in place of the human motion and gesture recognition.

BLOCK DIAGRAM:**SCHEMATIC DIAGRAM:****CIRCUIT BUILDING PROCESS:**

Connect the flex sensors attached on the fingers of the glove to the Analog pins of the Arduino UNO board. Give a 5v power supply. Connect A4 & A5 pins of Arduino to the LCD display and the digital pins to the ARP33A module. Here we can connect the digital pins as per the requirement of the number of voice commands that we are going to use in the Voice processor(ARP33a module). That module will be connected to a speaker from which we hear the audio signal output. We store the equivalent message of the voice command we stored in ARP33a Module in the program to make it visible as a text on the LCD display.

Note – If we have an Arduino Mini, NG, or other board, we need to press the reset button physically on the board, immediately before clicking the upload button on the Arduino Software.

OPERATING PROCEDURE :

Firstly the glove is worn to a hand and the commands are recorded by using ARP33A module record button. When hand gestures are given, the flex sensors attached to each finger of the glove have the flexibility to bend. And the command which is pre-recorded is played.

For the function of the operator we dump the program using arduino software into the circuit. 5V power is supplied to the circuit. Similarly the commands for the different hand gestures are obtained as output. The sign given by the dumb people is converted into speech.

PROGRAM CODE:

<pre>int flx1=A0; int flx2=A1; int flx3=A2; int flx4=A3; int v1=8; int v2=7; int v3=6; int v4=5; void setup() { pinMode(flx1,INPUT); //RF recv pinMode(flx2,INPUT); pinMode(flx3,INPUT); pinMode(flx4,INPUT); pinMode(v1,OUTPUT); //output to rec/ply pinMode(v2,OUTPUT); //output to rec/ply pinMode(v3,OUTPUT); //output to rec/ply pinMode(v4,OUTPUT); //output to rec/ply } void loop() { int flx1 = analogRead(A0); int flx2 = analogRead(A1); int flx3 = analogRead(A2); int flx4 = analogRead(A3); if(flx1 < 70) { digitalWrite(v1,LOW); digitalWrite(v2,HIGH); //1st voice digitalWrite(v3,HIGH); digitalWrite(v4,HIGH); } *continue from next column</pre>	<pre>else if(flx2 < 70) { digitalWrite(v1,HIGH); digitalWrite(v2,LOW); //2nd voice digitalWrite(v3,HIGH); digitalWrite(v4,HIGH); } else if(flx3 < 70) { digitalWrite(v1,HIGH); digitalWrite(v2,HIGH); //3rd voice digitalWrite(v3,LOW); digitalWrite(v4,HIGH); } else if(flx4 < 70) { digitalWrite(v1,HIGH); digitalWrite(v2,HIGH); //4th voice emergency digitalWrite(v3,HIGH); digitalWrite(v4,LOW); } }</pre>
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APPLICATIONS

- It can be used in hospitals, for the multi-measurement system, which allows to investigate the patients' physiological parameters.
- It can be used as a means of communication for people with speech disorders.
- With the help of this, we may be able to control electronic devices in your wireless network by adding a few gestures and commands.
- In games such as 3D games, at the place of Joysticks.
- It can be used in the conduct of military operations on the basis of the gestures that can be used to connect to the console.
- The hand gesture recognition system can be used in robots, computers, and tablets.

ADVANTAGES

- This is a social project.
- dumb people will be able to easily communicate with the ordinary people.
- It is easy to implement.
- A simple replacement of the touch, and windows, depending on the type of the hand.
- The portable design will be powered by a 5 V radio battery.

CONCLUSION

A sign language is a powerful tool to facilitate communication among the dumb, or dumb, community, and the people on the street. However, there is a communication barrier between the communities and the people on the street. The stupid people are making use of the standard language and that it is not so easy for ordinary people to understand. The project aims to reduce the communication gaps between the function of the community and of the real world. With this project, you are stupid, people can use the gloves to perform the sign, and it is going to be converted into speech so that normal people have it easy begrijpen. De the main features of this project are to use hand signals, flexible sensors have been directed not only to the process of converting sign language into speech, and it is well known that the inability to speak and be heard on one of the major problems in the history of mankind. To overcome these problems, a lot of research and development is carried out in various fields. The article is focused on the minimization of the major problems in the system, the expansion of the sensor, the sensor is equipped with facial recognition and voice recognition, and so, for the next phase of the project will be the face detection technology to capture expressions, which, in turn, improves the performance of the application by adding a little bit more accurate. For people who are partially disabled, in speech, the speech recognition system to improve speech systems for people with disabilities.

FUTURE WORKS:

- Designing of a whole jacket, which would be capable of vocalizing the gestures and movements of animals.
- Virtual reality application e.g., replacing the conventional input devices like joysticks in video games with the data glove.
- Designing of wireless transceiver system for "Microcontroller and Sensors Based Gesture Vocalizer".
- Perfection in monitoring and sensing of the dynamic movements involved in "Microcontroller and Sensors Based Gesture Vocalizer".
- The Robot control system to regulate machine activity at remote sensitive sites.

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