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Sign to speech converter for speech impaired people

Harsh Shekhar
harshshekhar24@gmail.com
Vellore Institute of Technology, Vellore, Tamil Nadu

Akash Deep Saha
akashdeepsaha03@gmail.com
Vellore Institute of Technology, Vellore, Tamil Nadu

Neha Kumari
kumari35neha@gmail.com
Vellore Institute of Technology, Vellore, Tamil Nadu

ABSTRACT

Our aim for this project was to create a communication system between speech impaired people and other, and we came up with an idea for making a glove through which the speech-impaired people can send any type of simple signs like raising a finger and for each sign there would be different command or signal associated with it which could be then converted and given out as sound output through the speakers. We believe this project could be used in wide area of application of not just for speech impaired people but also for elderly people who are bedridden or semi-paralyzed people.

Keywords— *Communication System, Speech Impaired People, Sign to Speech*

1. PROBLEM DEFINITION

Creating a communication system for speech impaired people by converting hand gestures to speech.

2. OBJECTIVES OF PROPOSED WORK

- It is hard for the speech-impaired people to express what they want to say to others.
- Likewise, it's also difficult for others to understand what the speech impaired person wants to express and not everyone knows to read sign language.
- Hence to bridge the gap, we are creating a communication system through which speech impaired people would be able to interact.
- Its primary aim is to give voice to the impaired ones by converting their hand gestures.
- The basic logic used is to convert the hand gestures into voice by which the person next to them could understand what message they want to give.In the case of emergency, if they are in trouble, they need any kind of help and they are unable to speak they can do minor hand gestures and our system's speaker would speak for them so that person in the next room can hear them and come to their aid.

3. LITERATURE REVIEW

[1] With the coming of wearable innovation, it is currently conceivable to actualize various and very imaginative plans to serve humankind in remarkable manners. Therefore roused, we have built up a brilliant framework that would have the option to fill in as closest companion to the conference and discourse disabled individual. The essential objective of this paper is to structure and actualize a minimal effort wired intuitive glove, interfaced with a PC running MATLAB or Octave, with a high level of precision for motion acknowledgment. The glove maps the direction of the hand and fingers with the assistance of twist sensors, Hall Effect sensors, and an accelerometer. The information is then transmitted to a PC utilizing programmed rehash demand (ARQ) as a blunder controlling plan. The framework is demonstrated for the contrastingly abled area of the general public to assist convert with signing language to a progressively human justifiable structure, for example, literary messages.

[2] People speak with one another utilizing discourse, hand signals, outward appearances, and communication through signing. It appears to be normal to utilize a similar sort of cooperation when speaking with PCs. This turns into even more significant for people tested with hearing and discourse debilitations. For instance, a few applications in instruction and excitement, for example, intelligent learning modules, address introductions, and 3D games have discourse input and yield abilities. Discourse and hearing-hindered people require constant communication via gestures motion acknowledgment and age to utilize these applications. Acknowledgment of human signals to comprehend the activities to be performed by the PC, and age of hand motions (that is, gesture-based communication words and expressions) as a substitute for discourse and sound information to deal with the prerequisites of the consultation disabled.

[3] In the United States utilize their voice as an essential device of exchange and are believed to be at higher hazard for occupation-related voice issues than the all-inclusive community. Nonetheless, gauges with respect to the commonness of voice issues in instructors and the overall public shift extensively. To decide the degree that educators are at more serious hazard for voice issue, 2,531 arbitrarily chose members from Iowa and Utah were met by phone utilizing a voice issue survey. Commonness the number of cases per populace in

danger at a particular time was resolved. The predominance of announcing a present voice issue was altogether more noteworthy in instructors contrasted and non-educators. Educators were likewise fundamentally almost certain than non-instructors to have counseled a doctor or discourse language pathologist in regard to a voice issue. Ladies, contrasted and men, not just had a higher lifetime commonness of voice issue yet, in addition, had a higher predominance of incessant voice issue, contrasted and intense voice issue. To survey the relationship between past voice issues and potential dangers, balanced chances proportions (ORs) were evaluated utilizing numerous calculated relapses. The outcomes recognized that being an instructor, being a lady, being somewhere in the range of 40 and 59 years old, having at least 16 years of training and having a family ancestry of voice issues were each decidedly connected with having encountered a voice issue previously. These outcomes bolster the idea that instructing is a high-hazard occupation for voice issues. Significant data is likewise given with respect to extra factors that may add to the advancement of voice issues.

[4]A portable remote specialized gadget incorporates lodging and handset conveyed by the lodging for transmitting and accepting radio recurrence (RF) signal conveying interchanges information of discourse. A processor is coupled to the handset for handling the correspondences information as discourse that is transmitted and got to and from the handset. A console and show are conveyed by the lodging and associated with the processor. A discourse to-content and content to-discourse module changes over correspondences information as discourse got from the handset to content that is shown on the showcase and changing over content that is composed by a client on the console in the interchanges information as discourse to be transmitted from the handset as an RF signal.

[5] The present development identifies with a hand-held correspondence help and strategy that helps the hard of hearing moronic and outwardly disabled people speak with one another and with typical people. The technique empowers hard of hearing imbecilic and outwardly impeded people speak with one another and with ordinary people on remote correspondence implies with no equipment extemporization. The technique empowers eye to eye correspondence and remote correspondence help for hard of hearing moronic and outwardly disabled people. This technique requires no alterations close by held specialized gadget utilized by typical person.

4. NOVELTY

So, these were all the papers where we saw the different work done in these fields and so, we are also doing the project in this field itself. Here, whatever the work that couldn't be done or was challenging we tried to sort it out through our ideas as through our project. In this project basically, we are trying to make gesture-based communication methods to convey their thoughts and the most common medium which can be is hand gestures. This will be an innovation to help mute people to communicate with others which will be a relevant solution and all this we will be doing this by using Internet of things by which we will find the way help them communicate. In this project we are imposing an idea to build our own sign to speech converter for enhancing this mode of communication.

5. ALGORITHM AND PROPOSED METHODOLOGY

(a) We are creating a glove through which the hand signals would be noted and for each signal, there would be a message associated with it that message would be then amplified, and it would be obtained out as a sound through the speaker.
(b) The user needs to wear the glove.
(c) Users can then do any hand gestures (raise fingers in any combination).
(d) Each combination would have a message related to it.
(e) The message would be passed on the amplifier.
(f) Finally, the message output would be obtained by the speaker as a sound.

6. MATERIALS USED

6.1 Flex Sensor

A bend sensor or flex sensor is a sensor that measures the amount of bending or deflection in any object. Normally, the sensor is attached to any surface, and resistance of this sensor component varies through bending its surface. Since the amount of bending of the sensor is directly proportional to the resistance it is used as goniometer, and it is often called flexible potentiometer. Flex sensors are basically a varying resistor whose terminal's resistance will increase as the sensor bends. So, this sensor's resistance rises depending on the surface linearity. Hence, it is normally used to sense the changes in linearity. In our project it would be used to sense hand gestures.

6.2 Arduino Uno

Arduino Uno is a microcontroller board that is based on the ATmega328P microcontroller. Arduino Uno has fourteen digital input/output pins (out of which six could be used as PWM outputs), six analog inputs, a sixteen MHz quartz crystal, USB connection, a power jack, an ICSP header and reset button. Arduino Uno contains everything on board which is needed to support the microcontroller; we simply need to connect it to a computer with a USB cable or provide it power through an AC-to-DC adapter or battery to get it running. In our Project Arduino Uno would be used to access input from the sensor and process it.

6.3 SD module

The SD card module is especially used in projects which require data logging. The Arduino Uno can create a file in the SD card to write and save data using the SD library. All the different models even though from different suppliers, they all work in a similar way, by using the SPI communication protocol.

6.4 Micro SD card

Added to SD card Module used as external storage for storing data.

6.5 Audio Amplifier (LM384)

The LM384 audio amplifier is audio powered amplifier for different consumer applications. For holding the system cost to a minimum, the gain of sound is internally fixed on 34 dB. A unique input stage is used which allows ground referenced input signals. An LM384 audio amplifier the output automatically self-centers and adjusts to one-half of the supply voltage.

The output of this audio amplifier is a short-circuiting proof of internal thermal limiting. The package outline of the amplifier is standard dual-in-line. In this amplifier a copper lead frame is used where the 3 pins situated at the center work as heat sinks. This makes the amplifier easy to use in basic p-c layout.

6.6 Adapter

To connect Arduino with pc and provide power to the system.

6.7 Speakers

Speakers are popular output devices used to produce audio output in the form of sound waves.

7. PROBLEM DESCRIPTION

Being tech aficionados, we have always felt that technologies should be available for everyone and for changing their life for good whether they are normal humans or especially abled people. The main benefits of technology are to empower people and make their day to day life easier in all feeds and for anyone who is in need of help let it be a normal person or any especially abled person. We have the knowledge about a great source of technology through which we could reach the large masses and people who are in need and make their lives much better and easier. Hence this is a small step from our side for those who are not able to communicate through their voice we wanted to give them voice and make their lives much easier.

Human beings collaborate with one another to convey their ideas, thoughts, and experiences to the individuals around them. However, this isn't the situation for speech-impaired individuals. Gesture-based communication makes ready for speech-impaired individuals to impart. Through sign language, communication is possible for a speech-impaired person without the means of acoustic sounds the aim behind this work is to develop a system for recognizing the gesture-based communication, which gives communication between speech impairment and normal people, thereby reducing the communication gap between them. Compared to the other gestures (arm, face, head, and body), hand gesture plays a significant job, as it communicates the users' perspectives in less time. Speech Impaired and other differently-abled people use various different ways to communicate like gesture-based communication methods like sign languages to convey what they want to tell in which the most common way of communication is through hand gestures. An innovation to help speech impaired people to communicate with others is a relevant solution, thanks to Internet of things there is a way to get everybody and everything talking. In this project we are imposing an idea to build our own sign to speech converter for enhancing this mode of communication.

This system aims to lower the communication gaps between the speech-impaired people and the normal world. The project proposes a translational device for speech impaired people using glove technology with four flex sensors and a voice module on to a glove to detect the gestures of a person. At last, it can efficiently translate Sign Language gestures to auditory voice with no disturbances.

The above figure shows that almost 20 Lakhs people in India are speech impaired. They are having difficulties to communicate with normal people and there is a certain communication gap. Our aim is to remove this communication gap.

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