



Hand Gesture Recognition And Voice Conversion System For Differently Abled People

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Abstract

Interchanges between hard of hearing quiet and an average individual have constantly been a troublesome errand. The endeavor hopes to energize people by strategies for a glove-based hard of hearing quiet correspondence middle person system. Each glove is inside furnished with a signal. For each specific gesture, the gesture module makes a relative change in resistance of flex sensor and accelerometer appraises the presentation of hand. The getting ready of these hand motions is in Controller. The glove fuses two techniques for action – getting ready mode to benefit every customer and an operational mode. The connection of letters to outline words is in like manner done in Controller. Moreover, the structure furthermore fuses a substance to talk change (TTS) square which translates the planned motions for instance substance to voice yield.

KEYWORDS : *Flex Sensor, Gesture, Glove.*

Introduction

Talking is the key strategy for correspondence for every customary individual. In any case, consider a talk obstructed person who can't prepared to examine as regularly as conceivable with a normal person. Since talk ruined people use communication through signing for their correspondence. In addition, most of the all inclusive community don't grasp communication via gestures. So it puts the talk debilitated individual in a troublesome situation. Starting late, masters have been thinking near to signals disclosures and been outstanding for making applications in the field of mechanical innovation and extended in the zone of phony or prosthetic hands that can mimic the lead of a trademark

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human hand. This endeavor disregarding the way that utilizes a near technique for the acknowledgment of the improvement of fingers, in any case we have endeavored to extrapolate the idea in a barely exchange perspective and have devised a little yet critical application in the field of bioengineering. The guideline focus of this errand is to plan an electronic talking system as a glove to diminish this correspondence issue. This contraption benefits a talkdebilitated individual to talk with a normal individual similarly likewise with a meeting crippled person. The rule section of this errand is a glove with five flex sensors that are related with Arduino Nano which is the key control unit of this endeavor. This device has a component of customer input. So talk crippled individual can without quite a bit of a stretch use his/her own one of a kind picked bearings for express signals.

I. Related Work:

S. Sidney Fels and Geoffrey E. Hinton, 1997[1] proposed a system which makes an understanding of hand signals to talk through an adaptable interface. Hand motions were mapped interminably to ten control parameters of a parallel formant talk synthesizer. The mapping empowered the hand to go about as a phony vocal tract that produces talk continuously. The structure have used a couple of information devices like Cyber glove, Contact Glove, three-space tracker, and a foot pedal a parallel formant talk synthesizer, and three neural frameworks. The signal to-talk task was parcelled into vowel and consonant age by using a gating framework to weight the yields of a vowel and a consonant neural framework.

Facial structure Shyurng Fahn and Herman Sun, 2005 [2] showed the headway of a data glove system using appealing acknowledgment twists as finger improvement sensor. These are little sensor circles, the appealing field drive changes with respect to time. It has limit of evaluating ten dimension of chance of a hand with only five sensors which were engineered on the palmer surface.as these sensors are organized on the finger phalange positions, there is no contact point between the sensors and the finger joints. As a result of these the condition of the sensor does not change as the finger turns, which would keep up the ideaof estimation and lifetime of the sensor.

To use gloves invaluable, clear and profitable arrangement process which contain two phases is in like manner given, with the objective that each and every required parameter can be settled thusly. They moreover gotten time division procedure to keep the hindrance among the generator twists and the sensor. The test outcomes of the sensors performing straight improvement and bowing point estimations were honestly finished using an oscilloscope in less uproarious circumstances. As in this paper they have alluring circles as sensors the structures is progressively impervious to electromagnetic obstacle

Michiko Nishiyama and Kazuhiro Watanabe,2009, [3]. shown a wearable distinguishing glove with embedded hetero-focal component optic nerve, which uses hetero-focus fibre optic nerve as sensors that perceive finger flexion to achieve unconstrained hand

development checking. As showed up in fig.1 The sensor Hetro focus contain a transmission fiber line whose expansiveness is $9\mu\text{m}$. single technique for transmission is used in Hetro focal component sensor e back of the hand with the ultimate objective that they are not affected by wrinkles in the glove joints. A laser diode of wavelength $1.31\mu\text{m}$ and an optical influence meter are used to check the transmission setback. Joining machine is also used. The sensor after modification can distinguish the joint edges of the fingers with complexities near to estimate and the hetero-focus recognizing methodology empowers the identifying glove to be worked with a base number of sensor centers. The hetro focus sensors reveals monotonic characteristic of optical incident execution with respect to the flexion purpose of joints. Regardless, paying little personality to this some optical fiber setback can be viewed using these sensors Kotaro Tadano, Masao Akai, 2010 [8] proposed a grip Amplified glove using pneumatic phony rubble muscles (PARMs) as showed up in fig 3. The PRAM is fitting with outright 10 degrees of chance and contain four units. To achieve control help development ,a PI control, which relies upon weight a motivating force from an inflatable sensor is performed .grow sensor makes the associated part free from the power. EMG instances of muscles are evaluated to survey the power help execution. The system ends up being progressively befuddled and enormous.

II. Existing Method:

Sign Language is the fundamental techniques for correspondence for hard of hearing people. With movement of science and development various frameworks have been made not only to restrict the issue of hard of hearing and bonehead people yet notwithstanding execute it in different fields. Sign language is a language which as opposed to voice or sound models uses manual correspondence and non -verbal correspondence to pass on the message. This incorporates generally the blend of shapes, presentation and advancement of the hands.

III. Proposed Method :

This paper presents a system display that can therefore see sign language to help normal people with imparting even more suitably with the gathering or talk ruined people. This endeavor includes an Arduino controller interfaced with flex sensors and Voice play back circuit. By using flex sensors we can convey particular motions, for each motion we coded a voice track .so other conventional individuals will easily fathom the thwarted individual .

Despite it we using a Bluetooth particular device. By using Bluetooth and Android application we can change over the voiceheadings into Text. This Text headings will appear on LCD which is useful for hard of hearing individuals as well.

V. Hardware Requirements:

The following are the components which we used:

Arduino:

It is a microcontroller board based on the ATmega328P (data sheet) it contains 14 digital input and output pins it is used as a general purpose microcontroller. It includes a USB Type-B connector, a DC power jack, and an ICSP header and a reset button. Arduino is an open-source hardware organization that provides easy-to-use gear and programming. Arduino boards can examine inputs - light on a sensor, a finger on a button, or a Twitter message - and change it into an output - starting a motor, turning on an LED, or conveying something on the web. You can direct your board by sending a great deal of code to the microcontroller on the board. To do all things considered you use the Arduino programming language (in light of Wiring), and the Arduino Software (IDE), in perspective on Processing.



Voice Play back Module:

This module is based on ISD1820, which is a different message record/playback gadget. It can offer genuine single-chip voice recording, non-volatile capacity, and playback ability for 8 to 20 seconds. The example is 3.2k and the complete 20s for the Recorder.

This module use is simple which you could coordinate control by push button ready or by Microcontroller, for example, Arduino, STM32, Chip Kit and so forth. From these, you can simple control record, playback and rehash, etc.



Fig3:Voice Playback Module

Flex Sensor:

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This flex sensor is a variable resistor like no other. The opposition of the flex sensor increments as the body of the part twists. Sensors like these were utilized in the Nintendo Power Glove. They can likewise be utilized as entryway sensors, robot bristle sensors, or an essential segment in making conscious plush toys.

Flex sensors are accessible in two sizes: one 2.2" (5.588cm) long and another coming in at 4.5" (11.43cm) long. Left level, these sensors will resemble a 30k ω resistor. As it twists, the obstruction between the two terminals will increment to as much as 70k ω at a 90° point. By joining the flex sensor with a static resistor to make a voltage divider, you can create a variable voltage that can be perused by a microcontroller's simple to- computerized converter.

How it Works:

One side of the sensor is printed with a polymer ink that has conductive particles installed in it. At the point when the sensor is straight, the particles give the ink an obstruction of about 30k Ohms. At the point when the sensor is bowed far from the ink, the conductive particles move further separated, expanding this opposition (to about 50k-70K Ohms when the sensor is twisted to 90°, as in the outline beneath).



Twisting the sensor the other way won't deliver any solid information, and may harm the sensor. Likewise take care not to twist the sensor near the base, as they tend to wrinkle and come up short.

Bluetooth:

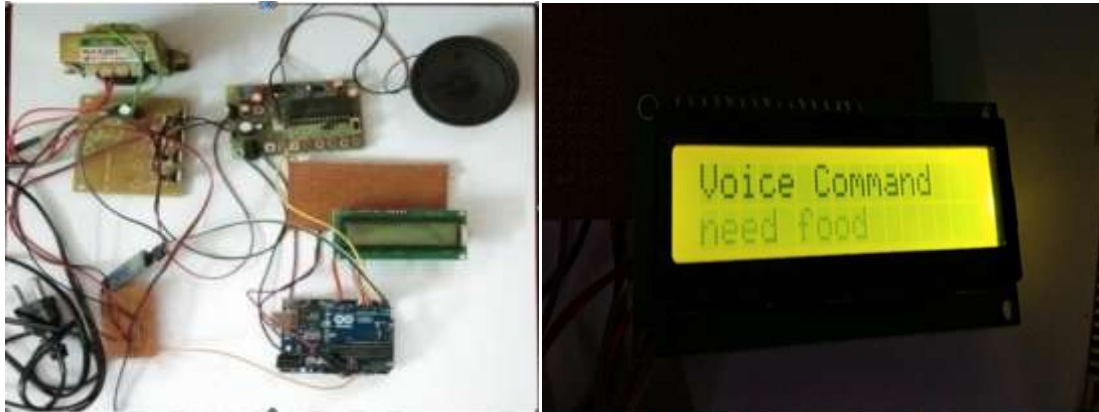
HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications. It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions. It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART).

Liquid Crystal Display:

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other.

Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

VI.RESULTS



VII. Conclusion:

The main purpose of this project is to help the deaf and dumb people. This Hand gesture recognition and voice conversion system can help the speech impaired people to communicate with normal people in the real world. Arduino is the main control unit for this project. A data glove is developed for the speech impaired patients. Now they don't have to face any kind of problem with their communication. Arduino was programmed such that configuration settings can readily change without changing the entire program code. The glove was prepared carefully so that everyone can use that glove. All the simulation was done before implementing the hardware circuit to make sure all the components that were used worked correctly. After achieving the desired output from the simulation, the hardware was implemented. After hardware implementation, final results were analyzed. Desired results were found. This Hand gesture recognition and voice conversion system will make a revolutionary change in the communication process of speech impaired people.

VIII. References:

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