

Sensory Gloves For Sign Communication

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Abstract- Communication is one of the most important need for all the human beings and for the people who are impaired face lots of difficulties to express their thoughts and emotions. They are always in need of support and depended on someone for communication with people around them. Usually impaired people use this sign gesture communication to express their emotions to someone. This system is planned using sensory gloves for sign language communication proves to be an answer for most of the difficulties faced by the impaired people and will also let them earn the opportunities they deserve. The main motive for this sensory system is to give voice to the impaired people.



Fig 1. Sensory Glove

Keywords- Flex Sensor, Microcontroller, Communication, Sensory Gloves.

I. INTRODUCTION

In this fast-moving world an impaired person face, lots of difficulties to communicate with people around them to show case their emotions and thoughts, usually their communication signs or ways are misunderstood by the people which leads to misconceived messages and only a few people can understand the true meaning of those signs and gestures. For example, making an arch shape with the fingers represents the alphabet 'C' and showing the index and middle finger at the same time represents the alphabet 'V' etc.

To understand the gestures made by the impaired people the person has to be either the relative of the impaired person or should have knowledge about the sign languages and due to lack of proper communication they often lose many opportunities that they deserve. The impaired people make different signs using their fingers and hands these gestures involves folding of fingers and hands into different shapes and each shape represents some alphabet or signs used to convey messages to a person. In the earlier days the impaired people always needed someone to help them in conveying (translating) their messages to someone. This study tries to give voice to those impaired people who struggles in all stages of their lives and to run their days smoothly.

II. LITERATURE SURVEY

[1] Smart Glove for Sign Language Communication:

This article reviews about the people who are all belongs to the deaf and dumb communities. This system provides easy communication with normal people by body language or sign conversation. This structure translates sign language into worthful English alphabets and phrases. This Glove method may be accurate for real time scenario and its accuracy can be increased with increasing number of sensors. However, this method fails to provide accurate solution due to abnormal motion and garbage values are added by sensors during this phase are undesirable.

[2] Sign Language to Speech Conversion:

In this paper, role is about a communication medium for disabled people to speak with others and it's implemented by using bend sensors and microcontrollers. during this system sign languages are used as a medium for mute people to convey their thoughts with symbols (i.e. gestures). In this glove type approach is established to catch the actions by bend sensors, so the output data shifts with amount of oscillation. This paper experiment is very difficult to arrange all symbols in customed library. And this makes some errors in gesture actions.

[3] Low-cost intelligent gesture recognition engine for audio-vocally impaired individuals:

This article gives note on framework of using flex sensor on sign language. Sign gesture is a communication for a human species like mute, ear-impaired and dumb. Using flex sensor implementation in sign language gives overall solution to these complications. The hand glove with the flex sensor uses the Arduino UNO at mega 328 micro controller for receiving input and HC-05 Bluetooth module senses the input gestures and converts it to text using android module. Voice module can give voice output for the receiver. This proposed project can use upto 32 combinations. Hopefully it can prevent the hindrances between the disabled people and the normal world making communication easier.

[4] *Online Hand Gesture Recognition & Classification for Deaf & Dumb:*

In this article American Sign Language is used. It uses MATLAB implementation. The webcam is used to capture the image in RGB format which further gets converted to grey image and binary image. Principal component analysis calculates eigen vector and values in a single matrix. Euclidean distance is used to classify feature gestures. White background is used for better image processing. Online hand gesture recognition makes communication effectively with people who are not well-known in sign language. Here the hand gesture is proposed and only when the light illumination system is good, we can get high accuracy.

[5] *A Hand Gesture Recognition Based Communication System for Silent Speakers:*

In upcoming decade, hand movement identification is mainly used in mankind digital conversations. They had a major role in sporting and managing application like remote controlling, pointing devices, and digital world controlling. Movement identification can be executed by two vital techniques namely sight-related approach and sensory-related approach. Owing to huge packet flowing, react in low force, bolting, barrier pressure in sight-related approach, the sensory related approach is figured in this article. All these strategies and sight-related approach require a digital platform for complex packet flowing. The transducers are selected evolved on the examining of hand tilting symbols, which also guides in improvising the count of transducers to be customized. The identified movements are then delivered through Bluetooth to the smart phone. These phrases are then sound off by giving machine translation voice to the impaired human species.

[6] *Bus Detection System for Blind People using RFID:*

This paper describes about bus detection mechanism for blind people. Here the main thing is about communication

bus and bus station. Using RFID tag, the blind people come to about their bus location through the number of the bus that is added in that tag.'

This RFID system tracks about blind people in bus station and it announces the notification message to the bus through voice or light indication. By this the driver came to know akin the presence of visionless people. And the depot announces bus route through the speaker, but it only applicable for distance of 2m.

III. HARDWARE:

1. FLEXSENSOR:

A tilt sensor or flex sensor is a transducer that computes the quantity of about-face and winding. Generally, this transducer is clamped to outward, and friction of transducer element is sorted by winding the outward. After all the friction is abruptly comparable to the quantity of tilt and it is crippled as goniometer, then it is generally addressed as modifiable potentiometer. By combining the tilt transducer with a stagnant counter to produce a potential, and also it will yield a wavering potential that can be see through embedded controller's correlative-to-digital converter.



Fig 2. Flex Sensor

2. ARDUINO UNO:

This is an embedded controller used as an openly accessible embedded controller board established on the micro circuitry of the embedded controller and enhanced by controller prototype platform. This panel is furnished with bents of algebraic and correlative in/out (I/O) pins, and this is confederated to peculiar extension panels (shields) and other circuits. This panel is equipped with 14 algebraic I/O pins (six adepts of PWM gain), 6 correlative I/O pins, and is gradable with the cross platform (for Windows and Linux), along a type B thumb drive port. And it is energized by the thumb drive port or by an outdoor 9-voltage power unit; anyhow it agrees potential within 7 and 20 watts.



Fig 3. Arduino UNO

3. POWERSUPPLY:

This also called as a transformer and it is a power appliance that stocks electrical potential to an energy freight. A major benefit of a transformer to transform conventional current linking an opening to the expected potential, light flow and iteration is to force the mass. Usually, the transformers are disparate as standalone pieces in the structure, at the same time remains are fixed in the power apparatus, that will force the mass. All the transformers provide an input link, which leaves vitality by all the rage of conventional current by opening, and it possess many more yields by forcing energy to themass.

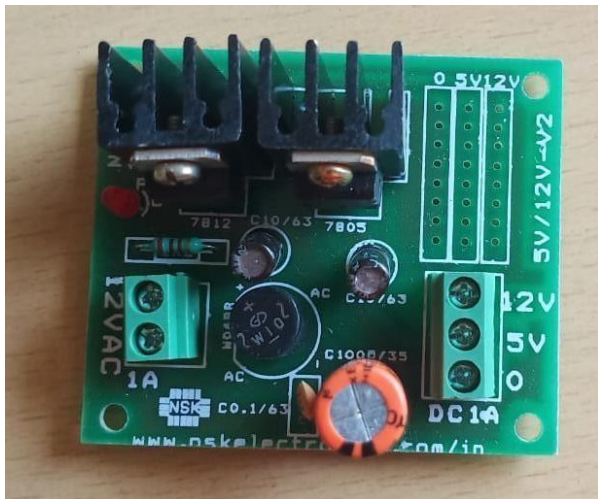


Fig 4. Power Supply

4.HC-05 BLUETOOTHMODULE:

This Bluetooth module is a simple serial module used to assist the Bluetooth Allochronic Port Compact module, which is apparently outlined for semitransparent wireless allochronic broadcasting and arrangement. This specified Bluetooth Module can be consolidated in either a Commander or Worker architecture. This allochronic port of module which uses blue core drivers fully enabled with updated version of

2.0 and it has amplified data count at the force gear up of 3Mbps which is added in addition. The Modulation is limited to 2.4 Giga Hertz frequencies applicable to radio listening device and baseboard. It furnishes the swaying mode between the commander and worker and is capable of using either obtaining or broadcasting data.



Fig 5. HC-05 Bluetooth Module

5.RFID READER AND TAG:

The Radio frequency Identification uses the force of field and currents that spontaneously for watching and tracing Radio iteration tags and it's affixed to the items. It is made from a very small low radio TPDR an adjuster and contributor. It broadcasts the algebraic data which generally is a listing number back to its reader making it useful to many industries. The reading tags are contrived by an IC, substrate and an antenna. And it is of apathetic and alive types. The former gets energy from short waves, whereas the latter from power units, which makes it more efficient than the other. Due to its extremely small size it can be integrated in any entity which paves way for technological progress.



Fig 6. RFID Reader and Tag

IV. PROPOSED WORK

The person who is impaired just need to wear those sensory gloves and have to make different gestures and sings using the fingers that particular message will be displayed on the mobile phone screen plus the corresponding voice message will also be executed.

The embedded flex sensor on the gloves detects the readings based upon the state of the flex sensor either straight or folded. When the finger is unmoved the flex sensor will give no readings and when the finger is folded the flex sensor detects the signals and delivers the readings to the embedded controller (openly accessible platform), then the microcontroller generates the required clock pulse, the generated clock pulse is then transferred to the ICD display and the generated pulse is displayed on the LCD display in a message format.

The message is also executed as voice output in the mobile phone through the Bluetooth. In this system HC05 Bluetooth module is used to get the information from the Microcontroller as millivoltage(mv) and then the converted data is sent to the mobile phone through the android application which is connected with HC05. The sensory gloves can also be used by the fully or partial visually impaired people who finds it difficult to read something. This system has another working with switches; here combine two switches together to give information about the next program in TV for blind people to hear news. These switches connected with Arduino UNO. It will get input from switches and give the notification of next program information to the user through voice and it is also displayed in the LCD display unit by phrases.

This system has additional working with switches for blind people to identify their bus stop with RFID TAG and Reader. It also acknowledges about their location and this information to the user is through voice and it is displayed in LCD display

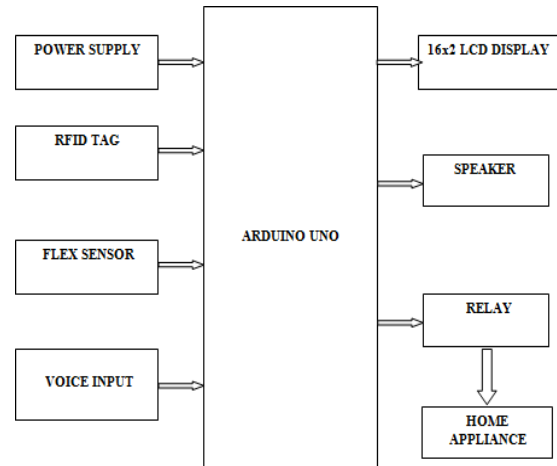


Fig 7. Block Diagram

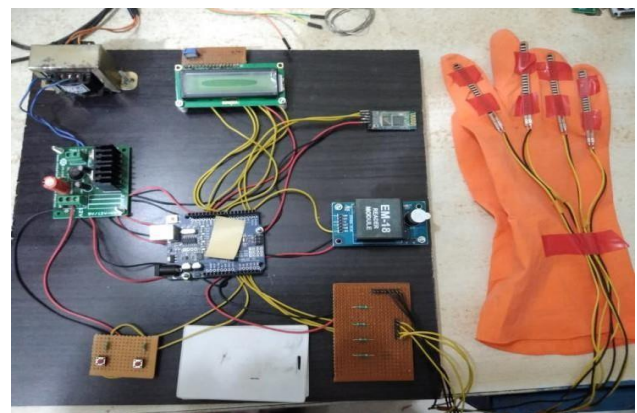


Fig 8. Hardware Implementation

V. RESULT

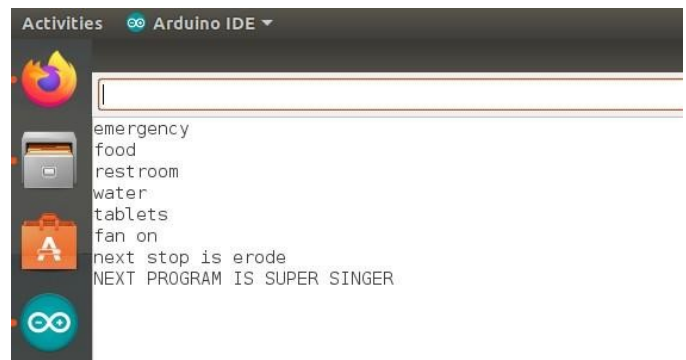


Fig 9. Output view through serial monitor

VI. FUTURE SCOPE ANDWORK:

There will be a many opportunity for the sensory gloves in the future, because it helps impaired person to easily carry out their everyday communication needs. Then by adding more sensors in each finger will identify the gestures more accurately and also increases reliability. On the other hand, this work tries to convert the detected words or messages into many languages as per the needs of the person

using the gloves and the person listening to the messages. This article only focuses on the implementation of the sensory gloves and it enhances the lives of the impaired people by giving them a new hope and support.

VII. CONCLUSION

A sign language is a method to communicate a person's messages or thoughts to someone using hand gestures and the interpretation of these messages needs to be very accurate and reliable to enhance the communication between the persons who are involved in it. The use of the Sensory Gloves by the disabled people to communicate messages will prove to be very beneficial and supportive in the coming future times as it will reduce the difficulties faced by the disabled people to express their thoughts and messages.

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