DESIGN OF MULTI MODEL INTERFACE TO ESTABLISH COMMUNICATION AMONG DIFFERENTLY ABLED PEOPLE USING IOT

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Abstract—I*n daily life, for the people who are deaf, dumb and blind, the communication among them is difficult. They can only communicate in sign language which is difficult to understand and interpret. So, to prevent this, an electronic frame work is developed using WIFI Module/IoT. In this project, the dumb uses the phone to send / receive text messages which are sent to the WIFI Module and the result is displayed using controller which is connected to the LCD display and played over the speaker, i.e. the messages are transferred from the phones to a controller via cloud and played on speaker for the blind who cannot use a phone. And when the blind person wants to speak, a mike is provided which in turn converts the audio into text and sends the message to the phones.*

Keywords: *Speech, IoT, wifi module, Braille system, electronic framework, bankers' algorithm*

This algorithm is used to test for safely simulating the allocation for determining the maximum amount available for all resources, which is also referred as detection algorithm multi model interface, mobile app, voice, speaker Apr kit, finger–wearable Device.

Edsger Dijkstra

Dutch computer scientist, Edsger Dijkstra, in 1959, proposed an algorithm that can be applied to a weighted graph. The graph can either be directed or undirected with the condition that the graph needs to embrace a non-negative value on its every edge. He named this algorithm "Dijkstra Algorithm" at his name.

Arduino Circuit Boards,

Blind, Deaf, Dumb, technical writing, science, engineering and technology, finger reader, finger view ,voice command, Embedded C.

I. INTRODUCTION

Nowadays, embedded system is emerging as an important trend in all applications. More recently developed embedded applications are changing our lifestyle in a smart way. Sign language is an expressive and natural way for communication between normal and dumb people. The intension of the sign language translation system is to translate the normal sign language into speech and to make easy contact with the dumb people. In order to improve the life style of the dumb people, the proposed system is developed. Sign. The physical gesture communication consist of hand gestures that convey respective meaning, the nonphysical is head movement, facial appearance, body orientation and position. Sign language is not a universal language and it is different from country to country.

Research in the sign language system has two well-known approaches. First the image processing technique using the camera to capture the image / video and second research approach is a sign language recognition system using a data glove.

The user need to wear glove consist of flex sensor, accelerometer and motion tracker. These Sensor output signals are fed to the computer for further process to recognize the hand gesture and to produce speech/text.

The main characteristics of human hand gestures can be summarized by their dynamic, multi-attribute property. To utilize hand gestures as a way of interaction, it is necessary to analyze the motion patterns for each of the gesture attributes and finally to extract the whole interpretation by integrating the relevant factors across time Gesture based applications widely range from replacing the traditional mouse as a position device to virtual reality and communication with the deaf. A complete vision-based system consisting of hand gesture acquisition, segmentation, filtering, representation, and classification is developed to robustly classify hand gestures. Approximately 285 million people are judged to be visually impair In all around the world about 9.1 billion people are deaf and mute .In their daily life they face plenty of problems on their communication. Sign language is a linguistic process which is employed for communication among the normal people and handicapped people. Sign language relies on sign patterns such as body language of the person and movements of the arm to facilitate the discernment between the great unwashed.

The deaf and vocally impaired people don't simply have to learn the customized sign language, but the core issue is that they can communicate with the usual sort of multitude in the society. It is similarly not possible for all the masses to learn the sign language to understand whatever is said through gestures. Therefore, the communication gaps still exist between the deaf and dumb people. Dumber people can simply tilt the message by sign language which could not be understandable by other people.

They can, however write and communicate easily. But it is not feasible. They suffer a lot in face-to-face communication. Hence, there is a need of a proper interpreter. The number of training institute of sign language in India is less so, we require a frame work which can act as an instructor or as well.

II. IMPLEMENTATION

ALGORITHMS:

Banker's Algorithm:

The Banker algorithm, sometimes referred to as the detection algorithm, is a resource allocation and deadlock avoidance algorithm dev eloped by Edsger Dijkstra that tests for safety by simulating the allocation of predetermined maximum possible amounts of all resources, and then makes an "s-state" check to test for possible deadlock conditions for all other pending activities, before deciding whether allocation should be allowed to continue.

The algorithm was developed in the design process for the THE operating system and originally described (in Dutch) in EWD108. When a new process enters a system, it must declare the maximum number of instances of each resource type that it may ever claim; clearly, that number may not exceed the total number of resources in the system. Also, when a process gets all its requested resources it must return them in a finite amount of time.

Banker's algorithm is named so because it is used in banking system to check whether loan can be sanctioned to a person or not. Suppose there are n number of account holders in a bank and the total sum of their money is S. If a person applies for a loan then the bank first subtracts the loan amount from the total money that bank has and if the remaining amount is greater than S then only the loan is sanctioned. It is done because if all the account holders come to withdraw their money then the bank can easily do it.

In other words, the bank would never allocate its money in such a way that it can no longer satisfy the needs of all its customers. The bank would try to be in safe state always.

III. SYSTEM ARCHITECTURE

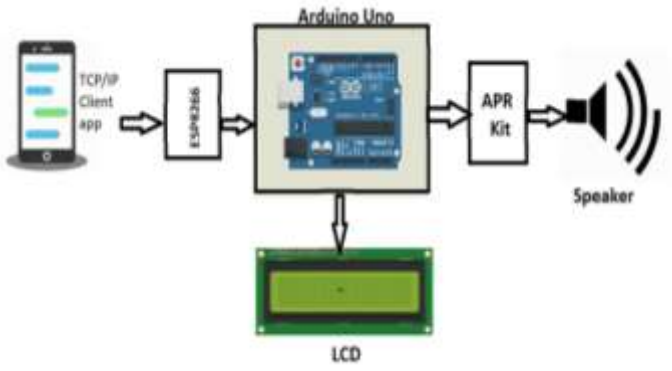

Fig: System Architecture

Fig: Finger Reader

Problem Statement:

Existing System:

In the earlier days the blind people are catered with the basic learning's of the Braille system. Braille is a scheme of raising symbols which the great unwashed who are blind or partially-sighted have been employed worldwide for over 150 years. The language in the Braille will go from left to right across the page, just like printed words. The symbols which represent teach letter are prepared up of between one and six dots based on the figure of six dots which we would pick up on a dice or a domino. Later in the evolution of the Braille system, there exists a system of screen reader which is a computer program that enables the blind masses to interpret what is shown on the screen through speech. Braille Scheme representation is shown in Figure.

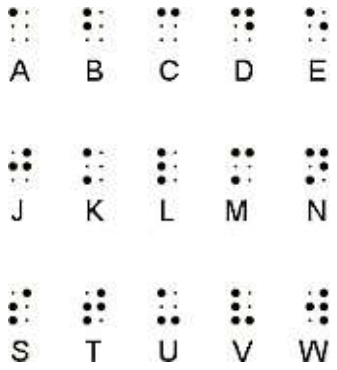

Fig: Braille Scheme

The finger reader is a device that helps visually impaired users with understanding texts and language. It is essentially a ring type model usually wears on their index finger, which houses a tiny camera and some hap tic actuators for feedback. People with vision impairment who setup 2.8% of the population, which naturally rely on tactile feeling through their fingers to learn Braille and gather data about the surroundings. On applying the finger–wearable device that is ready to use and gives them real time feedback which would fix their lives more comfortable. With the elongation of these gimmicks, there exists a Bar code scanner for blind people. Finger view is shown in Figure.

Fig: Finger View

Proposed System:

The Proposed Methodology is implemented by using an electronic framework. It consists of a voice kit, APR kit, wi-fi, and lcd. The two switches consist of four commands each. On default, one wi-fi will be active. If the voice is swapped, the other four commands will work.

The voices are identified by the voice recognition kit Sensor and it sends the signal to the Arduino Uno and through the Voice IC, the output is played on speaker and is displayed on LCD and speaker. Here, we use mainly two components which are the fundamental control units of the electronic framework.

IV.TESTING AND OUTCOMES

Software testing is a method to check whether the actual software product matches expected requirements and to ensure that's software product is Defect-free .It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements. Some prefer saying Software testing definition as a White Box and Black Box testing. In simple terms, Software Testing means the Verification of Application under Test.

WHITE BOX TESTING:

White box testing is a testing in which the softwaretester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It issued to test areas that cannot be reached from a black box level.

BLACK BOX TESTING:

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested

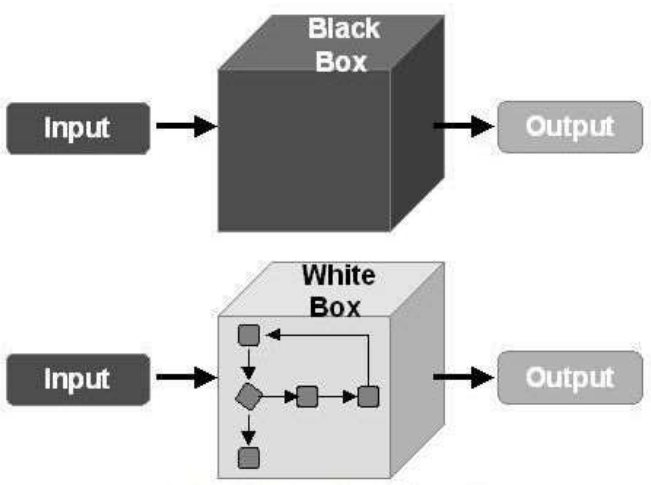

Fig: Black box and White box testing

Fig: Tabular differentiation between black and white box testing

Expected outcome of the project:

To develop a system which allows more messages to be sent and received by the people who are impaired. This is done using Embedded systems and IoT. The messages are transferred from the phones to a controller via cloud and played on speaker for blind who cannot use a phone. And when the blind person wants to speak, a mic is provided which in turn converts the audio into text and sends the message to the phones.

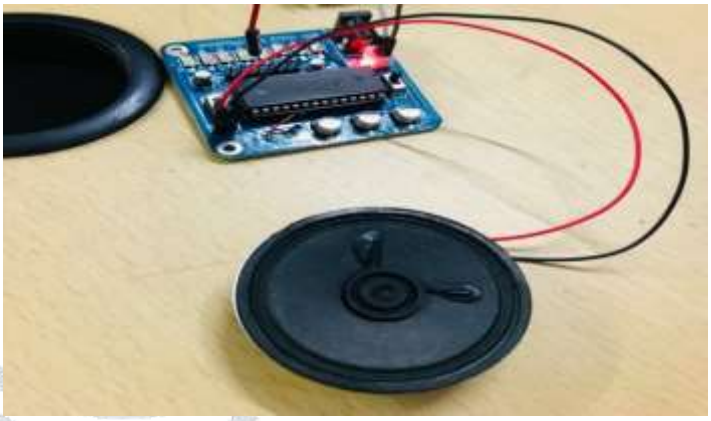

Fig: Voice is recognized by the Voice recognisation Kit and through speaker the command is given for the blind people

Actual outcome of the project:

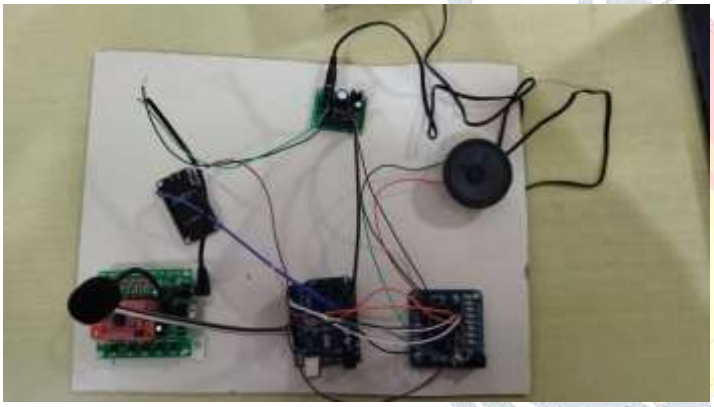

Fig: Setup of the Project

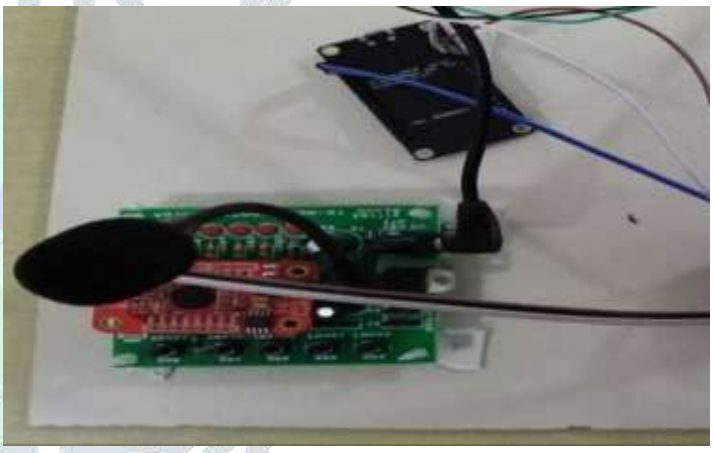

Fig: Through the mic the blind people interact/communicate with deaf and dumb

Fig: Deaf and Dumb peoplecommunicate through the phone via Wifi module

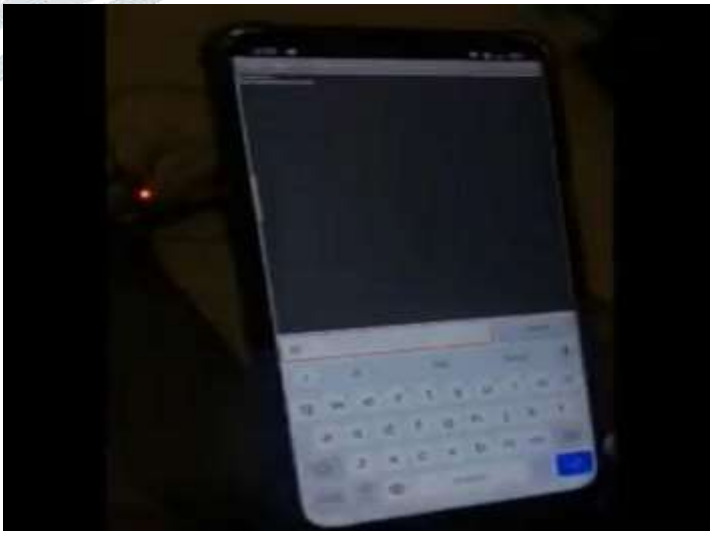

Fig: Those interaction/communication is converted to the text and shown in phone via Wifi module

Applications

- IoT Applications
- Voice Command Applications
- Automated Applications

IV. CONCLUSION

In this paper we propose a multi model interface and the principle reason for this task is to help the visually impaired, hard of hearing, and dumb individuals to speak with each other and further more with the typical individuals. This electronic frame work helps the unusually individuals with typical individuals in reality. The principle control unit for this venture is Arduino. An electronic framework is created for the visually impaired, hard of hearing, and dump individuals. Presently they don't need to confront any issue to impart.

Future Enhancement:

We aim for developing the prototype model for blind dumb and deaf people by employing in a single compact device. The project provides a unique solution for these people to manage their sites by themselves. The project is catered with the source code of Embedded C. It is a easy programming language to interface. The project is run by the source code to assist blind dumb and deaf people in a single device which is so compact and easy for them to manage.

V. REFERENCES

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