

Route Narrator and Communicator for Blind, Deaf and Dumb

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Abstract—The project solution aims at solving the routine based problems faced by the visually impaired. Blind people are dependent on others for moving from one place to another and on the other hand deaf and mute person faces major difficulty in communicating without words. To address these problem areas the complete working setup is divided into 3 modules and which will be later integrated to form of a waist belt. We develop a belt which will help the disabled people to travel safely and autonomously. Most of the obstacles will be detected by the belt and the person shall receive a pre-recorded message as a warning. We basically divide our project in three modules that is the Blind, Dumb and Deaf and Dumb module. We are using distance detection and hurdle detection for the blind also providing real time images of the environment and GPS location and send location to the other person through server. Dumb people can communicate by providing input in form of text and output is obtained into speech form. Deaf and Dumb people uses the gesture for communication and are converting these sign into speech form. The main feature of our project in that we are providing belt for all the tasks which complete and this solve the entire problem for the majority

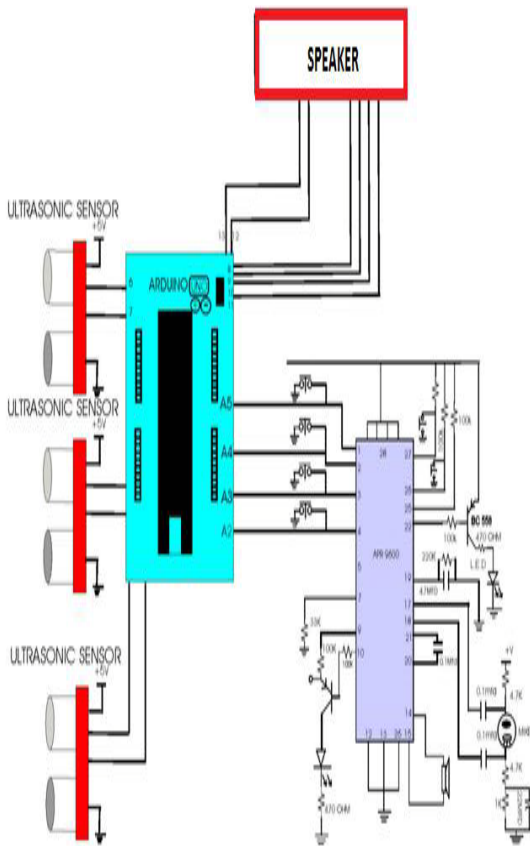
Index Terms— *Pre-recorded Message, GPS location, Text to Speech, visual feedback and gesture recognition.*

I. INTRODUCTION

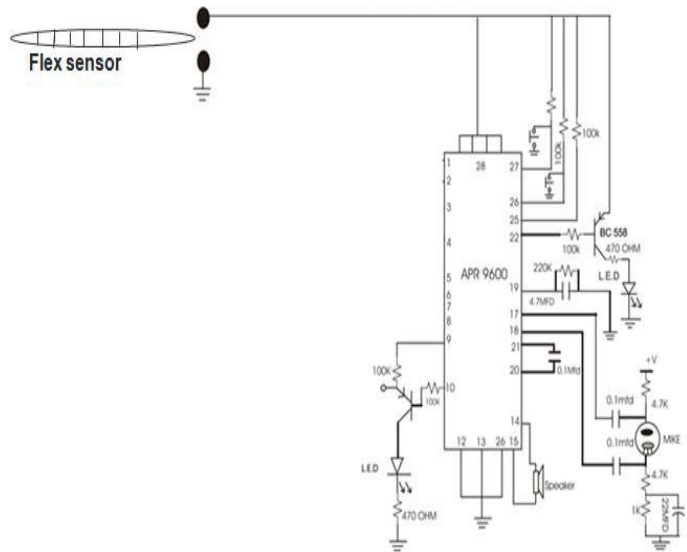
You have two hands, one to help yourself and second to help those who can't help themselves. It has been documented that 15% of total population of the world is disable and out of this Hugh percentage of 21 million people are disabled in India

itself. Further out of total 21million, 10 million are blind, which is much higher than deaf and dumb percentage. This project primary focus on providing virtual feedback of the real life obstacles to the blinds based on data collected from ultrasonic sensors and conveyed over voice messages. It also comes with emergency case panic button and GPS location tracker. For deaf and dumb person, the kit uses gesture recognition so that the person can communicate basic needs using finger movement. Therefore, the project works on Raspberry Pi which is an embedded system and uses Sensor. The Raspberry Pi collects all the data send by the Ultrasonic sensors and these sensor detects the coming hurdle. The output is presented to the user in form of a speech that is examined by the Raspberry Pi. The whole route is easily communicated to the blind person. The user can freely move from one place to another without facing any difficulty with the help of the device as the person knows the whole route. The device starts working as soon as it is powered on and starts analyzing the distance measurement based on object detection principle of ultrasonic sensors. Further the Arduino board coding makes the threshold based distance measurement decision and trigger the voice processor for generated voice messages. By default in the project we are using English as the language of our communication but we can program it for any language of our choice.

A. Blind Module



B. Deaf and Dumb Module



II. WORKING

- **Blind module:** Detects obstacles using different sensors and warns the user with voice alert. Captures image of environment when the person is stuck and sends location as well as real time image to his guardian.
- **Dumb module:** Converts given text input to speech output. User can trigger the input module via his mobile phone and speakers are used to convert that data into voice message.
- **Deaf and Dumb module:** Uses gesture recognition to identify the hand movement and convert these gestures into voice messages.

For the ease of understanding we simply divide it as discussed earlier. If we talk about the first module, then by placing the ultrasonic sensors for distance measurement and transmitter sensor for obstacle detection and touch broker for the water detection. We are using the ultrasonic sensors for more accuracy which sends signal to the microcontroller that is the Arduino Uno which in turn play a pre-recorded audio with the help of APR 9600 that is digital voice processor IC and alert signal is obtained on the speaker which is of 8V. The second module contains flex sensors with 5V as an input. It processes the signals and perform analog to digital conversion. The analog output from the sensors are passed through the

Arduino Uno and digital signal which is encoded will be transmitted through RF system. In the third module, each flex sensor is fitted along the length of each finger and thumb on which the data glove is provided. The flex sensors provide the output in a form of a stream of data that will vary with degree of bend of the finger. The analog output from the encoded and transmitted the RF systems. RF receivers receive the signal and the signals are used by the gesture recognition section through the decoder.

A. Blind Module

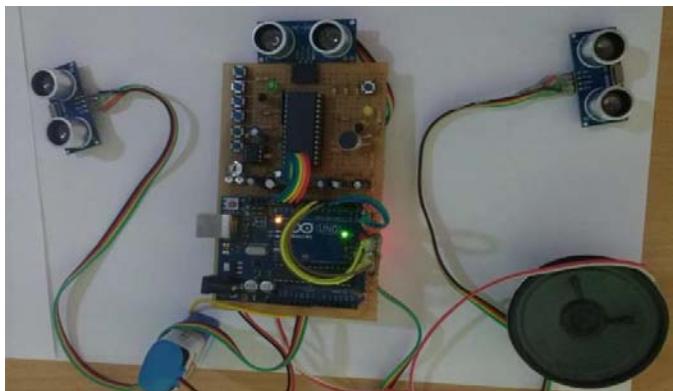


Fig. 1. Hurdle Detection

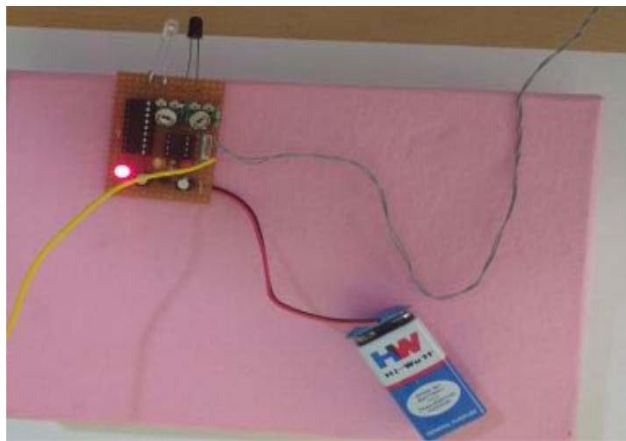


Fig. 2. IR sensor

B. Dumb module

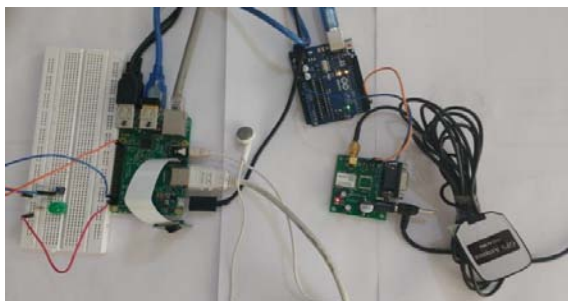


Fig. 3. Camera and GPS

C. Deaf and Dumb Module

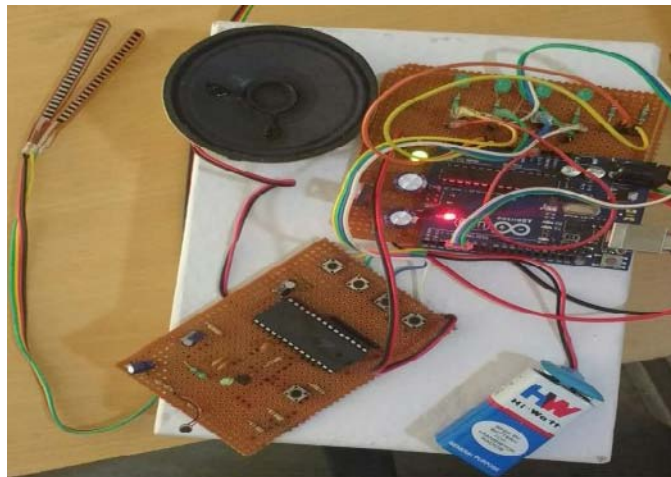


Fig. 4. Gesture Recognition

III. ADVANTAGES

- It can be used not only by visually impaired but also as a navigation tool by everyone under certain circumstances, for route narration like foggy mornings with low visibility.
- It can also be used as an alternative to various eye ailments by patients those who have gone post eye operative situations, cataract, exophthalmia and others who are suffering from.
- For geographical explorations, we can use such system by modifying them into a more sophisticated version, by using some high intensity ultrasonic waves.
- This system is a complete solution for blinds, deaf and dumb people which can be customized on demand.
- This system has many added advantages and features when compared to existing solutions but still it is very cost effective due to its integrated structure.

IV. CONCLUSION

The project “Route Narrator and Communicator for Blind, Deaf and Dumb” system is an integrating feature that is developed by using all the hardware components. Hence contributing to the best working unit for physically challenged which has been designed perfectly.

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