# Review on the design of Navigation assistance for Visually Impared - Third Eye

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**Abstract**

Individuals with visual handicaps are frequently tends to outer help which can be given by people, prepared canines, or exceptional electronic gadgets. The primary issue with dazzle individuals is the way to explore their approach to any place they need to go. Such individuals need help from others with great visual perception. As of the survey portrayed recently,10% of the outwardly debilitated have no utilitarian visual perception at all to help them move around without help and securely. This project is intended to assist and overcome the problem faced by the visually impaired people to a greater extent. The framework utilizes Atmega-328 microcontroller, which is embedded on aurdino board. For distance detection the framework utilizes a HC-SR04, a Ultrasonic Range Finder Distance Sensor Module. The sensor module is intended to gauge the distance utilizing the standard of SONAR or RADAR, utilizing ultrasonic wave to decide the distance of an article. The framework likewise comprises of a ringer to create a caution sound or an alarm and an engine to produce vibration signals. The framework utilizes sound and vibration signs to inform the client about forthcoming obstacle. As the distance among glove and snag reduces gradually, recurrence of both sound and vibration signals escalates. Hence this project provides an ease for the needy in case of Navigation. This framework is cost efficient, utilizes less power and portable which adds as an advantage.
***Keywords:*** Ultrasonic range finder sensor module, IR Sensor, micro controller.

## INTRODUCTION

As per the national survey conducted there are approximately 1.5% of the population are facing different kinds of visual disability issues. So, these people are very much depressed and have to depend on the others every time they need to move. They can't even perform their daily routine without anyone's help and support. So, their life becomes burden as every time there may not be availability of required help from others [1].

There is greater need of technology to make these people do their work without others help atleast in some of the cases such as their daily routines. As the role of Technology development is to know the issues and problems faced by the people and to think for the suitable ideas and applications to overcome it. In the same way there is a major role to be played by the technology to make visually impaired people to walk and to perform their activities on their own

There are many technocrats who analyzed this issue and found various solutions to overcome the problem of visual disability by the usage of other senses such as feel and hear.one of such include the third eye glove in which there will be a ultrasonic sensor attached to the glove and a vibrator and it is desgined in such away whenever object approches the ultrasonic senor measure the distance if the obstacle is in his path then the vibrator starts vibrating [2].

In our project we have analyzed this issue and as an advancement for the existing models we designed this project with a servo motor attached to ultrasonic sensor and an IR sensor. where servo motor creates a rotation of -90degrees to +90degrees by which if an obstacle is straight or at a deviation of 90 degrees it can alert the person to change his path along with this there is a speaker in this design which can alert the person when even obstacle is coming closer.

**Methodology**

The devices used in this are HC04 ultrasonic sensor, speaker, Arduino Uno, Proximity sensor, servo motor, capacitor, inductor, variable resistor.

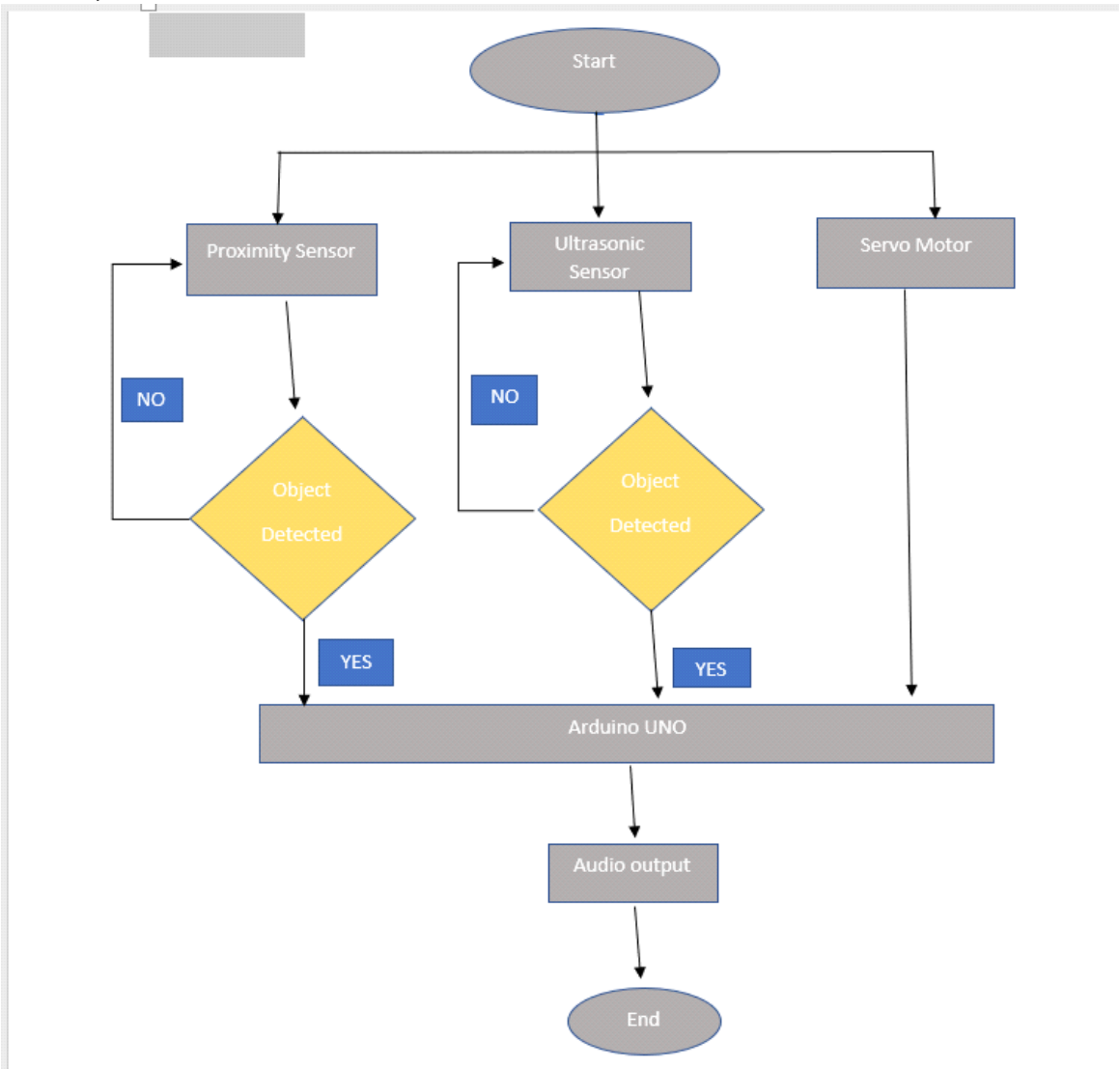


Fig1: Flowchart of the implementation

The flow initially starts from the input devices such as Ultrasonic sensor, Proximity Sensor and Servomotor and searches for the objects if any objects are found by any of the two sensors then it gives signals to Arduino UNO from Arduino UNO according to the signals received the output will be from the speaker using text to speech module.
If the object is not there will be no output and the sensors will respond only when there is an obstacle.
Connections:
Connect vcc of servo motor to power source +5v, ground pin to ground, and the middle pin to pin number 9 on the Arduino board. Connect ultrasonic sensor ground pin to ground, and VCC to power source of +5v, trigger pin to pin 7, and echo pin to pin8 of Arduino. Connect first pin of proximity sensor with a filter (using capacitor and inductor) to pin A0 of Arduino, connect VCC of proximity sensor to power supply of +5v, and connect middle pin of proximity sensor with a variable resistor to the Test pin.

Ultrasonic sensors emit short, high-frequency sound pulses at regular intervals. These propagate in the air at the velocity of sound. If they strike an object, then they are reflected back as echo signals to the sensor, which itself computes the distance to the target based on the time-span between emitting the signal and receiving the echo. As the distance to an object is determined by measuring the time of flight and not by the intensity of the sound, ultrasonic sensors are excellent at suppressing background interference. Virtually all materials which reflect sound can be detected, regardless of their colour. Even transparent materials or thin foils represent no problem for an ultrasonic sensor.

Ultrasonic sensors are suitable for target distances from 20 mm to 10 m and as they measure the time of flight they can ascertain a measurement with pinpoint accuracy. Some of our sensors can even resolve the signal to an accuracy of 0.025 mm. The servometer rotates from -90 to 90 degrees to and fro in order to help ultrasonic sensor to rotate so that objects from the left and right side can be detected

**Implementation**

**software:**

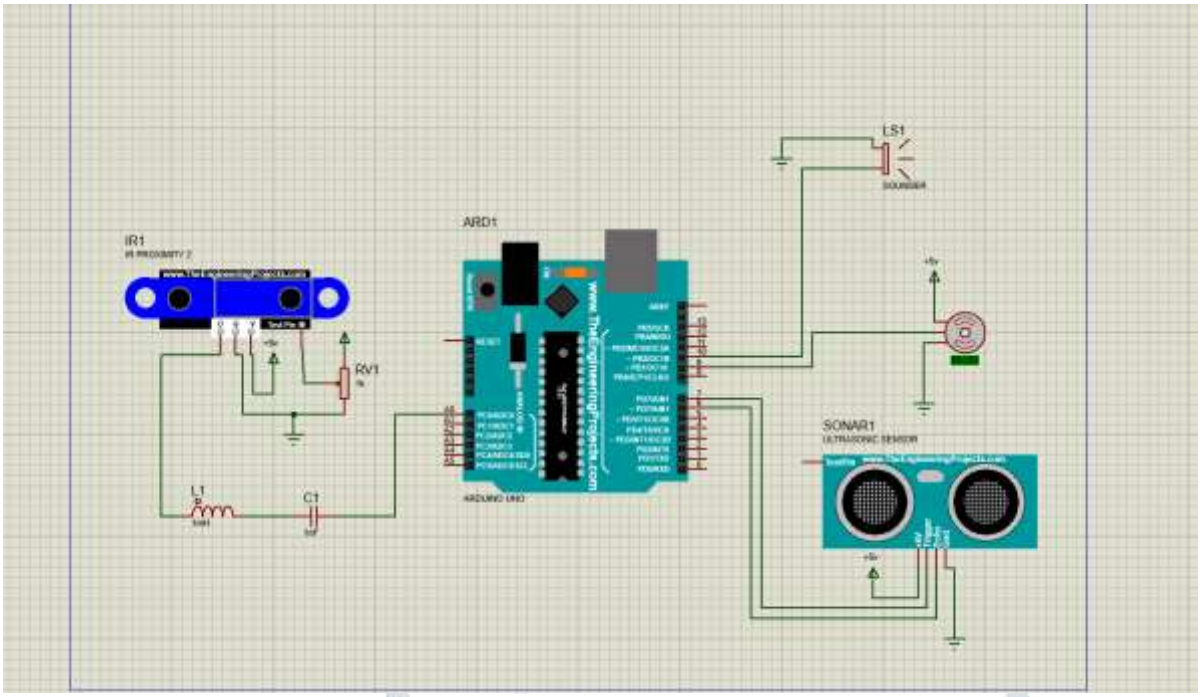


**Fig2:** Software Implementation of the Project

**Result and Discussions :**

This project is made by arduino UNO, proximity sensor, ultrasonic sensor,servo motor ,capacitors and resistors. After all the connections are assembled the output will be in audio format which gives commands from the speaker as shown in the above figure 2. When any object is found or interrupt the sensors (Ultrasonic and Proximity Sensor) the command will be given for the blind person from the speaker by alerting from the accidents from the objects/human beings/vehicles.

**CONCLUSION**

The main Purpose of this model is to solve the major problem faced by the dazzle.
By using this device they can walk in an indoors confidently without anyone's help This device is modelled to overcome the visual sense inability by using other senses like Sound. other than raising an alarm in case of an obstacle it can also gradually increases the frequency of the sound by which the person can know how much far the obstacle is and which can help the dazzle to react as of required. This device is not only having Ultrasonic Sensor but also equipped with IR sensor for an accurate Output. If this device is designed with at-most care and accuracy it will help the blind to move independently and perform their daily activities without seeking for others help and support.

**REFERENCE**

1. Ananth Noorithaya1 , Kishore Kumar M.3 and Dr.Sreedevi A ,"Voice Assisted Navigation System for the Blind ",Proceedings of International Conference on Circuits,Communication, Control and Computing (I4C 2014)

2. N.Harini and Sravya ,"Voice Assistance for the Blind",International journal of Advanced Science and technology -2020

3. Samartha koharwal , Samer Bani , Aparna Vyakaranam , "Navigation System for Blind - Third Eye" , International Journal of Innovative Technology and Exploring Engineering

4. ISSN:2278-3075,volume-8 Issue-5 March,2019

5. Amith Kumar V A,Kalias P A ,"The Third Eye-An Assistive Technology for the Blind", TecII innovative of science and Technology-2012

6. . Terrence Fong, Illah Nourbakhsh, Kerstin Dautenhahn, "A survey of socially interactive robots," Robotics andAutonomous Systems, 1st ed., Elsevier, 2003, pp. 143 – 166

7. Nadia Kanwal , Erkan Bostanci , Keith Currie , and Adrian F. Clark,"A Navigation System for the Visually Impaired: A Fusion of Vision and Depth Sensor",Research Article Open Access Volume 2015 Article ID 479857

8. ounirBousbia-Salah , AbdelghaniRedjati , MohamedFezari , MaamarBettayeb," AN ULTRASONICNAVIGATIONSYSTEMFORBLINDPEOPLE", JAN-2007

9. Mounir Bousbia-Salah, Mohamed Fezari ," A Navigation Tool for Blind People",April-2007

10. 1Alma S , Nithya Sree S , Podili Alekya , Ramya S N , Lovee JAIN," BLIND GUIDE-AN OUTDOOR NAVIGATION APPLICATION FORVISUALLY IMPAIRED PEOPLE",International Journal of Advances in Electronics and Computer Science, ISSN: 2393-2835

11. MS. Anuradha , B. Patil ,MS. Shefali , M. Patil , MS. Nikita , A. Gargatte , " GPS BASED SMART NAVIGATION SYSTEM FOR VISUALLY IMPAIRED PERSON",Project Reference NO.: 40S_BE_0416

12. Anika Nawer , Farhana Hossain , Md. Galib Anwar , " Ultrasonic Navigation System for the visually impaired & blind pedestrians",American Journal of Engineering Research (AJER) e-ISSN : 2320-0847 p-ISSN : 2320-0936,Volume-04, Issue-02, pp-13-18