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# DRISHTRONIC-The Electro Tonic to the blind

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----------**ABSTRACT**----------
*For a visually challenged person to survive the fittest, in this world, the person must go through all the obstacles without the guidance of others. One of the preventive measures to avoid the obstacle by the blind, is to provide an assistive implementation which can help to wander on their own. The aim of this project is to provide an assistive technology used for the purpose of enhancing the mobility of the blind pedestrian which is commonly and basically referred to as ETA. In this project, the user is given with a belt implemented with a sensor to sense the obstacle before them. The belt also has some vibrators to indicate the obstacle location to the user. This can be done with a help of a microcontroller which decides the operation to be held like rangefinder technology, controlling the driving circuits of vibrators, etc.,*

***INDEX TERMS –*** *ETA (Electronic Travel Aid).*
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## I. INTRODUCTION

The main motivation behind this paper is that blind persons can be motivated without having the inferior feeling of their problems and also to pay way for the blind to move on their own.

The mobility of the blind is considered as a problematic situation. Since to cure this problem, we have to form some assistive implementation of the electronics combined technology. In 1970s, the ETAs are used for the blind. These travel aids include guiding canes or walking stick as simple. The canes then are implemented with sensors using laser, infra-red waves. But it is considered as a disturbance or an inconvenience for blind to carry it everywhere it is needed. Similarly blind guiding dogs are restricted to certain limits to go with the humans.

Our system is a complimentary as well as replacing system for other travel aids like guiding dogs, canes, etc., .In this system, we revised all the components used in this implementation to latest versions. It can also serve the purpose of guiding for both blind people and blind as well as deaf people.

## II. LITERATURE SURVEY

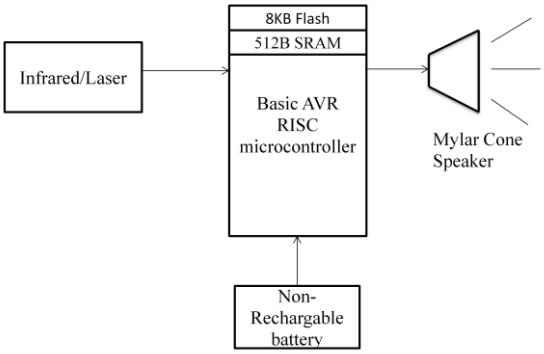
Manoj badoni et.al…[1] has proposed the distance water pit indicator using AVR ATmega8 in ETA for blind. In this system, the discrete distance of the object and water pits in the path of the user is sensed by ultrasonic sensor and an audio signal respectively. Sankar Kumar. S et.al…[2] has proposed the embedded glove to aid the visually impaired using SONAR feedback. Amjed S. Al Fahoum et.al…[3] has proposed a research article about a smart infrared micro-controller based blind guidance system. Mounir Bousbia Salah et.al…[4] has proposed the development of a pedestrian navigation aid for the blind. Sandra Mau et.al…[5] has proposed ETA for the blind which uses a handheld device for sensing the obstacle before user. Nancy C. darling et.al…[6] has proposed a preliminary follow up study of ETA users which can be very useful for the users to navigate with ETA devices. A. Fusiello et.al…[7] has proposed a multimodal electronic travel aid device which is of wearable prototype. Shruti Dambhare et.al…[8] has proposed a smart stick for blind which includes purposes such as obstacle detection, artificial vision and real-time assistance with GPS.

## III. EXISTING METHODOLOGY

In this existing methodology, the ETA is used with earphones or with alarms as output. For a visually challenged person, the guiding methods are done either by guiding dogs or by canes. The canes with either lasers or infra-red waves are used. As time passes, the canes are used with electronic components with a voice command to indicate the obstacle before the user. These can be inconvenient to the other persons due to the irritating sounds from the device.

In the existing technology, infra-red or laser sensors are used to sense the obstacles. After the detection of the obstacle, the signal is sent to the microcontroller with flash memory and SRAM. The experimental arrangement is subjected with the power supply from a non-rechargeable battery. The output is given as an audio command or simply a sound from a Mylar cone speaker. Another method uses a rechargeable battery with really vast size to accommodate. Since it is necessary to recharge the battery, an adapter is provided with it.

The infra-red sensors have blind-spots so that it does not cover a wide range in vertical as well as horizontal planes. Thus more sensors are necessary to make it work effective.



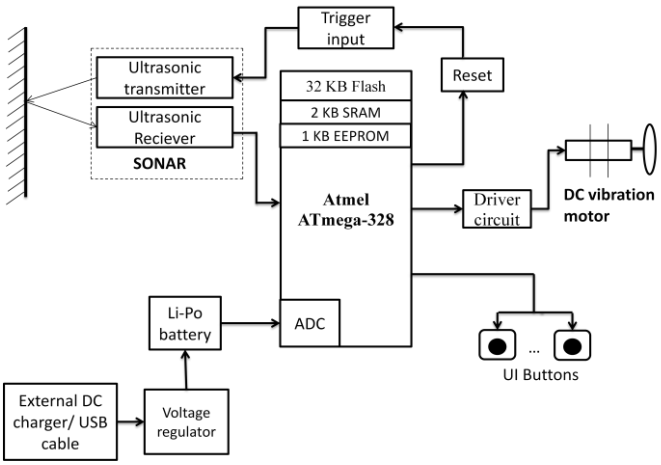

## IV. PROPOSED METHODOLOGY

The proposed methodology involves about the assistive technology both deaf and blind combined users. This paper includes the ultrasonic sensors which are not easily dependant on any other factors whereas the infra-red sensors may vary according to the temperature changes.

Also many systems and technologies are using infra-red ranges, when bio-medical goes into, it will create a chaos. The ultrasonic sensors can detect either knee level or overhead obstacles.

When using the audiometric output, the device becomes limited to the blind only. So gaining a vibrating output can serve the purpose to both deaf-blind users. The proposed methods includes a wearable belt-prototype, thus using canes, torch like hand-held devices, head-mounted devices proves to be cumbersome.

## V. BLOCK DIAGRAM OF PROPOSED METHODOLOGY




### A. ultrasonic sensor

This sensor is used to sense the obstacle in front of the user. The ultrasonic sensor transmits a beam of ultrasonic waves. The waves after hitting the obstacles, reflects back the ultrasonic waves to the sensor. With this signal reflected back from the obstacle, the device can determine the distance of the obstacle location from the user. It requires 5V supply. It measures at an angle of 15 degree in vertical and horizontal planes. It can estimate around a distance of 2 cm to 400 cm range of the obstacle location.

**B. Microcontroller**

The microcontroller used here is Atmel ATmega 328p. It consists of 28 pins from which 14 pins are used. It uses 32 kB of flash memory, 2 kB of SRAM(Static Random Access Memory) and 1 kB of EEPROM(Electrically Erased Programmable Read Only Memory). It resets the trigger input and gives it as a trigger input to the sensors.

**C. Vibrating motors**

It requires 65 mA of current to vibrate it to the desired need. It rotates at the speed of 14000 rotation per minute. It dimensions include 0.4 cm * 3.1 cm. It has nominal operating voltage of 5V.

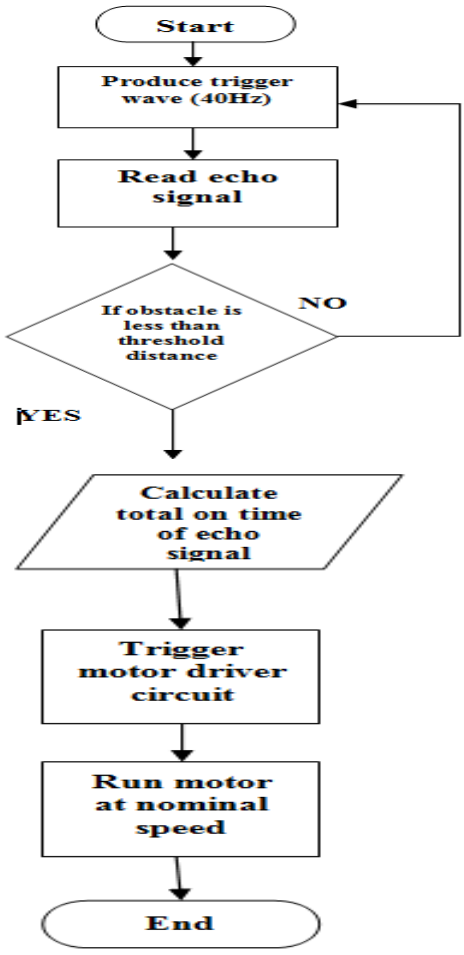
**D. Motor driving circuit**

The motor driver circuit consists of 16 pins. This motor driver circuit has a capacity of running two motors at the same time. It gives supply to both the vibrating motors. It acts as an interface between microcontroller and vibrating motors. It allows bidirectional running of motors.

## VI. WORKING

When the user goes in with the device, the device starts to send the ultrasonic waves out. Once when the ultrasonic waves detect the obstacle, it gets reflected back to the receiver placed inside the sensor. Then the signal is sent to the microcontroller where the signal is filtered, processed and finds the obstacle location. It also produces the command signal to the driver circuit. The driver circuit acts as an interface between the microcontroller and the vibrating motors. Thus the corresponding vibrating motors vibrates in response to which sensor is sensed**.**

## VII. FLOW CHART



## VIII. RESULTS AND DISCUSSION

This prototype thus gives a vibrating output for the user at the nearest side of the belt accordingly to the side of the obstacle location. Before using this device, the user must undergo a training session of how to use it.

## IX. CONCLUSION

The project presents a theoretical model, a demo model and a system concept to provide a smart electronic aid for both blind and deaf people. The aim of the overall system is to provide a low cost and efficient navigation aid for blind which gives a sense of artificial vision by providing information about the environmental scenario of static and dynamic objects around them to provide overall measures – Artificial vision and object detection.

## REFERENCE

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