

The Third Eye for the Blind

Ashmitha M

Dept:

Information science and of Engineering,
Alva's institute Engineering and
technology

Moodbidri

Mahantesh G

Dept:

Information science and of Engineering,
Alva's institute Engineering and
technology

Moodbidri

Sachin G

Dept:

Information science and of Engineering,
Alva's institute Engineering and
technology

Moodbidri

Abstract:

Essentially, it is difficult for blind people to spend their everyday lives with We interfaced those with their disabilities to make their stick smarter, With their walking stick scheme. For the visually impaired, the third eye is A progression, like hardware, with the assistance of the subject Designing, software engineering and science of well-being can aid People who are visually impaired. We interfaced some smart in this device Their stick roles. Whenever the obstacle is identified via ultrasonic on the way. The sensor placed on the stick triggers the camera to capture the object. Which is on its way. The picture captured is sent to the processor to Identify the object's form and then intimate it as a beep sound Via speakers or Raspberry Piconnected earphones. But that's what the blind may be able to recognize the object in front of them. If there is a major one, Like a vehicle, they will walk on the basis of the object in an obstacle. Of them in front an innovative stick built for visually impaired people is the blind stick. For enhanced navigation, citizens. Here we recommend the Advanced Blind a stick that makes it easy for visually impaired people to navigate Using sophisticated technologies. Integrated with the blind stick. Along with light and water sensing, the ultrasonic sensor. Our suggested idea Second, the project uses ultrasonic sensors to identify future barriers using Waves of ultrasound. The sensor transmits this information to sensing barriers, in the microcontroller.

This information is then processed by the microcontroller and it determines whether the barrier is near enough. If it is not an obstacle,

microcontroller sends a buzzer-sounding signal. often, it detects and if it senses swater and warns the blind, a separate buzzer sounds. One more feature is that it helps the blind to detect whether there is light or whether there is light. The darkness in the chamber. One more

advanced feature of the system is Integrated to help the blind, if they forget that they kept it, find their stick. For this reason, a wireless RF based remote is used. Hitting the button. A buzzer on the stick sounds like a remote button that supports the blind. A individual to locate their stick. This method therefore allows for barriers Detection and stick detection if visually impaired are misplaced by Individuals. Keywords: Smart Stick, Ultrasonic Sensors GSM/GPRS, and Microcontroller.

Keywords: LCD, Raspberryphi, Ultrasonic sensor.

Introduction:

Eighty to ninety percent of legally blind individuals have an observable experience of vision or light. Many visually disabled individuals experience challenges accessing public transport and learning as well. In addition, a wellbeing screening scheme is also introduced for the visually impaired. It is difficult to navigate the everyday life of blind people. This initiative allows them to handle their lives as normal. They can create this project in their hands as a gadget or a computer that sense the barrier. This project is more effective than the

current method, which is cheaper and more reliable. We are using the Arduino UNO board here to carry out this process. To make the life to be as a normal one for the blind peoples this may be very helpful project for them. The machine uses an ultrasonic sensor to identify an object with its higher detection range in a wide range of fields. We are taking a survey at our institution based on this initiative. This gadgets function like the radar and the gadget's arrangement utilizes the fascicle of ultrasonic waves to tallness, course and pace. As the wave is moving, the separation between the person and the impediment is calculated. Nevertheless, all the existing mechanisms inform the visually impaired the proximity of the protest to clear separation in front of or near him. According to the WHO or the World health organization, 39 million people around the world are assessed as blind. This paper suggests an innovative technology that is user friendly to achieve ease of access to public transport and learning for visually disabled people. Methodology is outlined in the experimental results of the research and discuss the potential study and conclusion. The study of the literature survey is presented. There are several methods of assistance that can be used to help blind people recognize items. These technology can be divided into two classes: Automated services, Human powered services. The inability to see is blindness.

According to the International classification of diseases, there are four types of visual function: Normal vision, mild visual impairment, serious visual impairment, Blindness modern visual impairment coupled with severe visual impairment is grouped under the word 'Poor vision': low vision combined with blindness reflects all visual impairment. The third eye for the blind is aimed at preparing an item that is especially useful for those people who are externally weakened and people who also need to rely on others. Third eye for the blind task is a invention that enables outwardly weakened people to step around and move with speed and certainty between various locations by recognizing the adjacent obstacles using the wearable band assistance that delivers ultrasonic

waves that warn with them with buzz sound or vibrations.

Methodology:

The Blind stick is a revolutionary stick designed for enhanced navigation for visually impaired people. Here, we suggest an innovative blind stick that allows visually impaired people to use advanced technologies to navigate with ease. Along with light and water sensing, the blind stick is integrated with an ultrasonic sensor. Second, our proposed project uses ultrasonic sensors to detect barriers with ultrasonic sound. The sensor transfers this information to the microcontroller while detecting obstacles. Then this information is interpreted by the microcontroller and determined whether the obstacle is near enough. The circuit doesn't do anything if the obstacle is not that close. The microcontroller sends a signal to sound a buzzer if the obstacle is near. If it senses water and warns the blind, it also detects and sounds a separate buzzer. It is also integrated as part of a complete unit, including hardware and mechanical components. Embedded systems currently power many widely used devices. 98% of all microprocessors are developed as components of embedded systems. Low power consumption, compact scale, rugged operating ranges, and low per unit cost are the general-purpose

equivalents. This comes at the expense of limited computing power, which makes it much harder to program and communicate with them. However, by creating intelligence structures on top of the hardware, taking advantage of potential existing sensors and the presence of an embedded unit network, there sources available at the unit and network levels can be optimally controlled as well as enhanced functionalities can be given, well beyond the available ones. It is possible to design intelligent techniques to control the power consumption of embedded system. Modern embedded systems are often popular, especially in more complex systems. In either case, forms ranging from general purpose to

those specialized in certain groups of computations or even customized built for the application at hand at the processors used. The digital signal processor is a common standard class of dedicated processors (DSP). Since the embedded device is dedicated to particular tasks, it can be optimized by design engineers to reduce the product's size and cost and improve reliability and efficiency. Some embedded systems, benefitting from economies of scale, are mass produced. The uses of the proposed program as follows, these examples are:

- Recognizing products in a supermarket.
- Differentiating between boxes that have similar shapes and sizes, like soft drink cans and juice boxes.
- Differentiating between medicine containers and eye drops.
- Checking the expiration dates of different products.
- Differentiating between colors and paper money.
- Reading text and book titles.

Components of model

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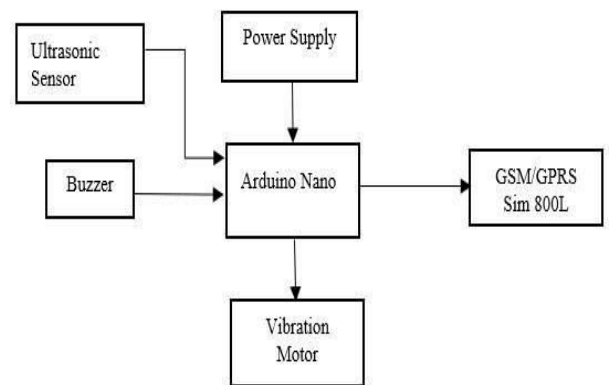


Fig 1. System design

ARDUINO NANO

By receiving input signal(Digital/Analog), Arduino can regulate the environment and can influence its environment controlling lights, relays and other equipment. Using arduino software, the microcontroller on the board is programmed.

ULTRASONIC SENSOR

Ultrasonic is the generation of sound wave above the frequently of human hearing which can be used in a range of application such as sonic rulers, proximity detectors, motion detectors, liquid level measurement. Ultrasonic is the development of sound waves above the frequently of human hearing , Ultrasonic Ranging Module_SR04

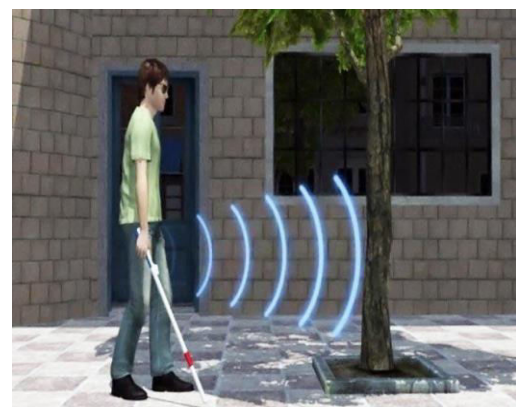


Fig 2. Obstacle detection

GSM/GPS 800L

The microcontroller can process the message with the keyword saved on it when the GSM modem receives a message. Then, from the GPS modem, it gets the position of the stick and transmits the location to the GSM modem in order to respond to the sender. In the event of any emergency. The microcontroller button accesses the location from a GPS modem and transmits the location to a GSM modem that sends SMS messages to all the numbers stored in the microcontroller.

BUZZER

The transducer that usually work Converts electrical energy into mechanical energy. The buzzer is in the lower portion of the 20HZ to 20KHZ audible frequency range. This is achieved in the audible range by transforming an electric, oscillating signal. In the form of audible waves, towards mechanical energy. In this study, Buzzer is used to warn the blind individual against obstacles by producing sound proportional to the distance from the obstacle.

VIBRATE MOTOR

To improve the overall input for the person who receives the alert against obstacles a vibrator motor is used in various vibration formats.

SOFTWARE REQUIREMENTS

The Arduino microcontroller is a single board computer that is easy to use but powerful, which has gained considerable popularity in the hobby and professional market. The Arduino is open source, ensuring that hardware is reasonably priced and software for development is free. This guide is for ME2011 students, or students who are facing the Arduino for the first time, anywhere. Prowl the web for experienced Arduino users; there are tons of tools. In Italy, the Arduino project was launched in order to build low-cost interaction design hardware. The

Wikipedia article for Arduino provides a description. Working principle

The microcontroller that controls the other components in the system is the primary part of the

system. The buzzer and the vibration motor will activate when the ultrasonic sensor detect any objects or obstacles in the 180-degree direction. In addition, when the GSM modem receives a message, it is sent to the microcontroller, which gets the location of the stick from the GPS modem and, in response to the sender, transmits the location to the GSM modem. Cameras can be used in places with low signals, this device works by fitting a camera on the head of the people, it would use some algorithm to classify the highs and obstacles in front of the blind person. The user of the stick presses the emergency button in case of an emergency and the sign from the button goes to the microcontroller that gets the location from the GPS modem and transmissions. The GPS modem and transmit the location to the GSM modem which will send a SMS messages to the all saved numbers in the system.

Application

Third eye of people who are blind is an innovation which helps the blind people to navigate with confidence by detecting nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration.

Proposed system

In this proposed system, while a blind person walks on the road by holding this walking stick, when there is an obstacle, it is being captured using a camera and that image is passed to object identifying cloud and give warning about that object through ear pad. Additionally the system has an interface of Wireless device with the walking stick, Another connected device is held by the Blind person, if they supposed to lose their stick or if it fell down, when they press the button1 in the transmitter, beep sound will come from the walking stick. So they can able to find their walking stick, if user presses the button2 then they can able to track the location. Similarly, if they press button3 we can access different features and can read the books line by line. The Raspberry Pi takes a picture of the page, OCR converts it to text

and espeak speaks it aloud through speakers connected to Raspberry Pi.

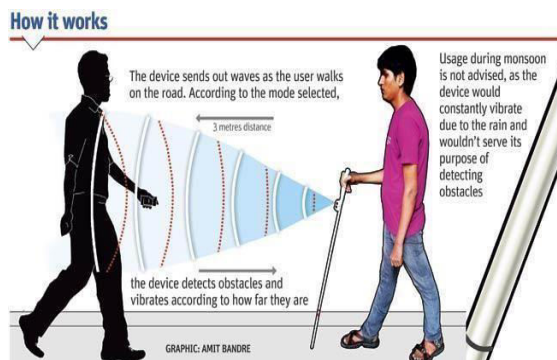


Fig 3. Working Principle

Conclusion

The third eye for Blind project is an innovation which helps the blind person to move around and go from one place to another with speed and confidence by knowing the nearby obstacles using the help of the wearable band which produces the ultrasonic waves which notify them with buzz sound or vibrations. This system also focuses on most of the navigation problems faced by blind people indoor as well as outdoor. A simple, cheap, configurable, easy to handle electronic guidance system is proposed to provide constructive assistant and support for blind and visually impaired persons. The system is designed, implemented, tested, and verified. The realtime results of the system are encouraging; it revealed an accuracy of 93% in detecting different shapes, materials, and distances. The results indicate that the system is efficient and unique in its capability in specifying the source and distance of the objects that may encounter the blind. This system does not require a huge device to be hold for a long distance, and it also does not require any special training. The electrical circuit design was assembled with power supply source, UV sensor, Audio Jack, Siren, Vibrator are connected. The main purpose of this study is to produce a prototype that can detect objects or obstacles in front of users and feeds warning back, in the forms of voice messages to users. The sensors have been utilised fully to ensure safe and secure mobility of the visually impaired people. Since three sensors

are used, objects can be detected in front of the person as well as on either side. This system is easy to use and does not require any sort of training. Therefore, it was favoured by those who participated in the test. The IR sensor has been fully utilized in order to advance the mobility of the blind and visual impaired people in safe and independent way. This system does not require a huge device to be hold for a long distance, and it also does not require any special training. This system also resolves limitations that are related to the most of the movement problems that may influence the blind people in their environment. Future work will be focused on enhancing the performance of the system and reducing the load on the user by replacing the speaker's tune by real human sound to guide the blind exactly. Moreover, shape detection test for objects that move at different rotational speeds across several distances will further be considered.

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