



THIRD EYE FOR BLIND

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Abstract : This Vision is the most beautiful and important gift from God to all his creatures especially for human beings. But unfortunately, there are some people who lack this beauty and are unable to capture the beauty of this world with their own eyes. Third eye for blind is an innovation which involves various areas such as, software engineering, hardware designing and science that enables visually impaired persons to see and explore the world confidently and independently by recognizing the neighboring objects by using ultrasonic waves and inform the person with a beep ring or vibration. They are facing troubles in their lifestyle. This device can act as an innovation for visually impaired people. From a lot of advantages, we found the property of being reasonable within a limited cost, a very important merit of the project. The Arduino Nano board is attached in goggles. This is provided with ultrasonic sensor, consisting of module. By utilizing this sensor module, the person can see the objects near them and can travel effectively. At any point where this sensor senses any object, it informs the person by beep-sound or vibration. In this way this becomes a computerized gadget. Accordingly, this gadget will be of utmost use for the blind people and can allow them to move from any place with confidence.

Keywords – *Arduino Nano, Ultrasonic Sensor HC-SR04, Buzzer, Jumper Cables, Battery 9v Dc.*

INTRODUCTION

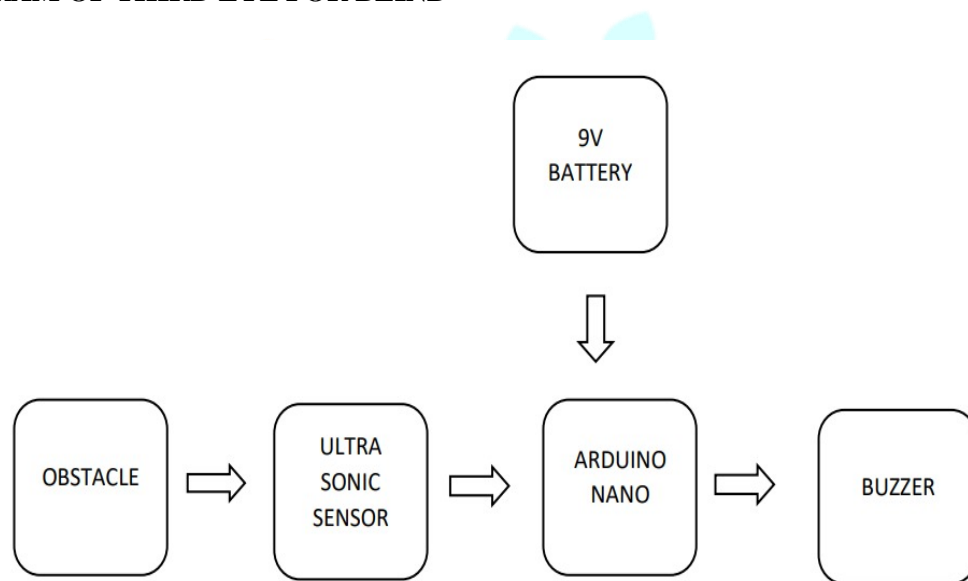
Third eye for blinds is an innovation which helps the blinds people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration. They only need to wear this device as goggles. According to WHO 39 million people (about twice the population of New York) are estimated as blinds worldwide. They are suffering a lot of hardship in their daily life. The affected ones have been using the traditional white cane for many years which although being effective, still has a lot of disadvantages. Another way is, having a pet animal such as a dog, but it is expensive. So, the aim of the project is to develop a cheap and more efficient way to help visually impaired to navigate with greater comfort, speed and confidence. As per the definition of blindness, we mean the person without sense of sight. A blind person has no ability to see anything. While struggling for the different levels of comforts of the general population, we have reached a point where we have started to completely ignore the people who are living a miserable life due to lack of vision. They face enormous challenges in their daily lives and hence end up living a dependent life. They experience a completely different life from the normal people and experience detached and uninterested conduct towards them for being physically disabled. They need other individuals for their movement from one place to another. Sight is the basic sense of life and therefore a person's movement from place to place in this condition is a major challenge for the visually impaired. The target of this task, this project for the blind or visually impaired person will provide a gadget that is helpful to them as well as the persons who depend on any individual due to lack of sight. Third eye for blind task can be an innovation for the sightless individuals, it will help them to move from here and there and among different places with confidence by knowing the nearest obstructions while wearing the goggle which leaves the ultrasonic waves which inform the person with beep-sound or vibration It can let the person who is not able to move and distinguish even snags due to lack of vision. They just must put on the gadget as goggles. At present, enormous techniques and brilliant innovations are available for the physically disabled 9 people, almost all of these devices have solved some of the issues for the sightless people but there exist many demerits like they require considerable measures of preparing and high maintenance. The uniqueness of the proposed advancement is, it is fair for everyone, the total cost being under \$20 or 1500 INR. In the market, no such devices are available that look like an item that can be worn with so much less effort and clarity. By increasing the usage of the gadget and upgrading the changes in the model, it would be profitable to the people with less or no vision at all. The basic mechanical gadget that is the strolling stick is manufactured so that it can be used in identifying

stationary objects on floors, unbalanced surfaces, holes, steps using the basic mechanical matter. The gadget is fine, convenient but because of compact area it cannot be used for vast snag identification. The device works like radar, orientation of the device uses the ultrasonic waves and collect them to note the altitude, direction or also velocity of that object. The separation among the object and person is assessed on the travelling of the wave. Nevertheless, all present systems advise the person about the closeness of the protest at a certain space in forefront or near the individual. The interesting aspects enable the unsighted person to distinguish snags and grant him access to choose his path properly with no issue. This device can help the person in identifying any type of hindrance like a snag. For surviving the earlier stated restrictions this project work provides primary, productive, customizable and effective solution to the visually impaired.

NEED OF THE SYSTEM

Our Project “Third Eye for Blind” will help to Navigate them. We have tried to keep it a budget so it's affordable to everyone. It works by sending ultrasonic sound and then sensing the reflected rays and thus determining the distance. We have used Arduino as Microcontroller and Buzzer for giving Feedback Output.

BLOCK DIAGRAM OF THIRD EYE FOR BLIND



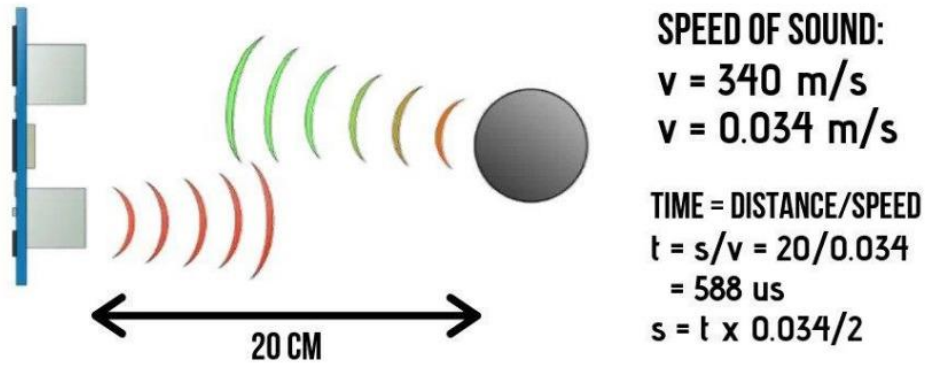
COMPONENT USED

5.1 Ultrasonic sensor

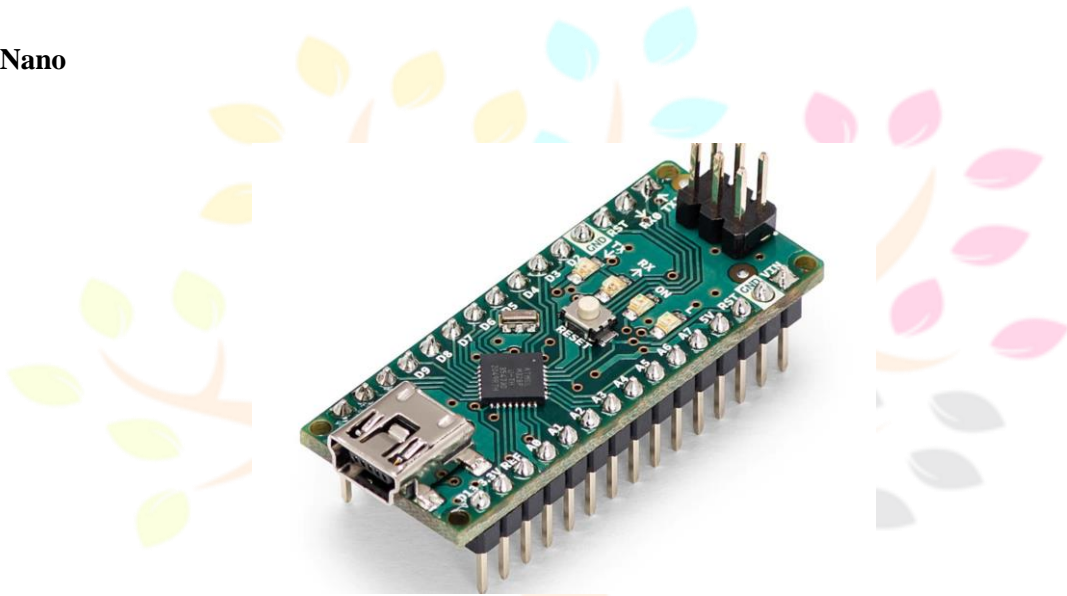


Ultrasonic sensor an ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. The ultrasonic sensor works on the principle of SONAR and RADAR system which is used to determine the distance to an object. An ultrasonic sensor generates high-frequency sound (ultrasound) waves. When this ultrasound hits the object, it reflects as echo which is sensed by the receiver. Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear. They then wait for the sound to be reflected, calculating distance based on the time required. This is similar to how radar measures the time it takes a radio wave to return after hitting an object. While some sensors use a separate sound emitter and receiver, it's also possible to combine these into one for ultrasonic sensing, the most widely used range is 40 to 70 kHz. The frequency determines range and resolution; the lower frequencies produce the greatest sensing range. At 58 kHz, a commonly used frequency, the measurement resolution is one centimeter (cm), and range is up to 11 meters having an ultrasonic element alternate between emitting and receiving signals. This type of sensor can be manufactured in a smaller package than with separate elements, which is convenient for applications where size is at a premium. Ultrasonic sensors are used around the world, indoors and outdoors in the harshest conditions, for a variety of applications. Our ultrasonic sensors, made with piezoelectric

crystals, use high frequency sound waves to resonate a desired frequency and convert electric energy into acoustic energy, and vice versa.



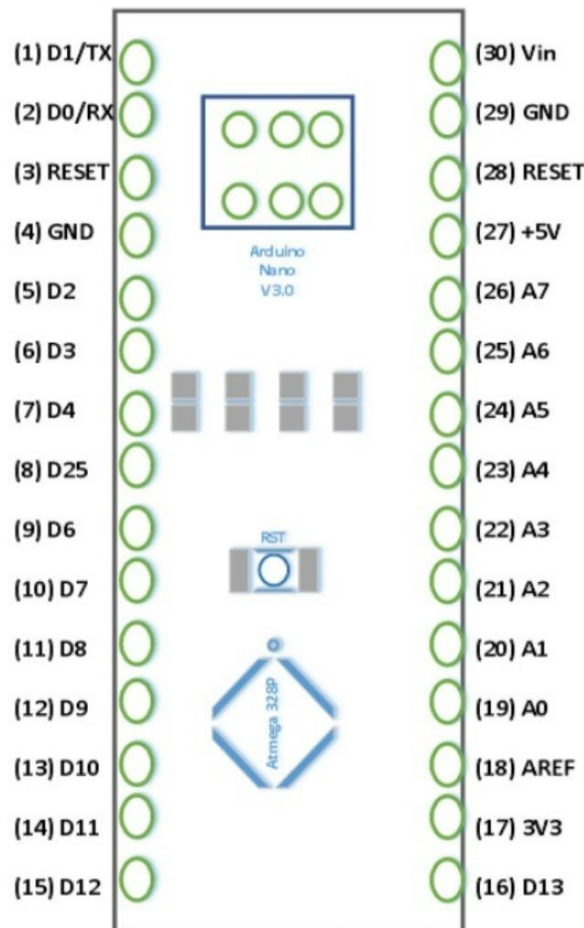
5.2 Arduino Nano



Arduino nano The Arduino Nano is an open-source breadboard-friendly microcontroller board based on the Microchip ATmega328P microcontroller (MCU) and developed by Arduino.cc and initially released in 2008. It offers the same connectivity and specs of the Arduino Uno board in a smaller form factor.

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5.2.1 Arduino Nano - Pinout



Arduino nano pin configuration is shown below, and each pin functionality is discussed below:

5.2.1.1 Power Pin (Vin, 3.3V, 5V, GND): These pins are power pins -

- Vin is the input voltage of the board, and it is used when an external power source is used from 7V to 12V.
- 5V is the regulated power supply voltage of the nano board and it is used to give the supply to the board as well as components. □ 3.3V is the minimum voltage which is generated from the voltage regulator on the board.
- GND is the ground pin of the board.

5.2.1.2 RST Pin (Reset): This pin is used to reset the microcontroller.

5.2.1.3 Serial Pins (Tx, Rx): These pins are used to transmit & receive TTL serial data.

5.2.1.4 External Interrupts (2, 3): These pins are used to activate an interruption

5.2.1.5 PWM (3, 5, 6, 9, 11): These pins are used to provide 8-bit of PWM output.

5.2.1.6 I/O Pins (Digital Pins from D0 – D13): These pins are used as an I/P otherwise, O/P pins. 0V & 5V.

5.2.1.6 Analog Pins (A0-A7): These pins are used to calculate the analog voltage of the board within the range of 0V to 5V.

5.3 Buzzer



A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke. When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's the sound that you hear. By changing the frequency of the buzzer, the speed of the vibration changes, which changes the pitch of the resulting sound.

5.4 Battery 9v Dc



A battery is an electrochemical device that produces a voltage potential when placing metals of different affinities into an acid solution (electrolyte). The open circuit voltage (OCV) that develops as part of an electrochemical reaction varies with the metals and electrolyte used. A battery is a device consisting of one or more electrochemical cells with external connections for powering electrical devices such as flashlights, mobile phones, and electric cars. When a battery is supplying electric power, its positive terminal is the cathode, and its negative terminal is the anode.

5.5 Jumper Wire



Generally, jumpers are tiny metal connectors used to close or open a circuit part. They have two or more connection points, which regulate an electrical circuit board. Their function is to configure the settings for computer peripherals, like the motherboard. Suppose your motherboard supported intrusion detection. A jumper can be set to enable or disable it. Jumper wires are electrical wires with connector pins at each end. They are used to connect two points in a circuit without soldering. You can use jumper wires to modify a circuit or diagnose problems in a circuit.

PRO'S

- 6.1 Object detection:** It could assist in detecting obstacles, objects, or even people, contributing to safer navigation.
- 6.2 Increased independence:** With improved spatial perception, blind individuals may experience greater independence in their daily activities.
- 6.3 Enhanced spatial awareness:** A third eye could provide additional sensory information, improving the blind person's understanding of their surroundings.

CON'S

- 7.1 Ethical considerations:** Implanting a third eye raises ethical questions about human augmentation and potential societal impacts.
- 7.2 Adaptation challenges:** Learning to interpret and integrate information from a new sensory input may be challenging for some individuals.
- 7.3 Technological limitations:** This project can't detect pits and Humps This project work proper only in indoor area This project can't detect fast moving objects such as (car, bikes etc.)

CONCLUSION

This project proposed the design and architecture of a new concept of Arduino based Virtual Eye for the blind people. A simple, cheap, efficient, easy to carry, configurable, easy to handle electronic guidance system with many more

amazing properties and advantages is proposed to provide constructive assistant and support for the blind and visually impaired persons. The system will be efficient and unique in its capability in specifying the source and distance of the objects that may encounter the blind. In this project has the capability and help Blind People Navigate without the need of expensive tech or Dog or Sticks. This system can be paired with goggles, a Similar Project has been tested on Blind People and has generated Successful Positive Results. This Project can help transform Blind People's lives in a Positive way.

FUTURE SCOPE

Use of specially designed boards instead of Arduino and high-quality ultrasonic sensors makes faster response which make the device capable of working in crowded places more efficiently. And, we also add the pit and humps detection.

REFERENCES

- [1] <https://www.arduino.ec/en/Guide/Introduction>
- [2] <https://learn.sparkfun.com/tutorials/what-is-an-arduino/all>
- [3] <https://www.instructables.com/THIRD-EYE-FOR-BLINDS-an-Innovative-Wearable/>
- [4] <https://en.wikipedia.org/wiki/Arduino>

