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# THIRD EYE PROJECT USING ARDUINO

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**ABSTRACT:** The objective of ‘The Third Eye project using Arduino’ is to design a product which is very much useful to those people who are visually impaired and those who often have to rely on others. It serves as an extra vision for blind which include both hardware and software. It help the person to recognize the distance of object in its path by the help of ultrasonic waves which comes from ultrasonic sensor and produces a vibration generated by the vibration sensor and the buzzing sound by the buzzer.

This project is cheap in cost, easy to carry, easy to operate and it will drastically benefit the community.

**KEYWORDS:** Arduino nano, ultrasonic sensor, vibration sensor, obstacle detection, buzzer

## I.INTRODUCTION

As we all know that blind peoples face many problems for their locomotion. Infact, they undergo a lot of rigorous, apathetic and indifferent behaviour. So, to overcome the difficulty for their motion our group has decided to make a product which is very useful for these peoples.

This is a wearable technology which try to solve the problem while walking inside the house or somewhere outdoor. We are using ‘Arduino nano’ in which the input is given by ultrasonic sensor in form of ultrasonic waves and the output is produced in the form of buzzing sound and vibration. The object detection is done by ultrasonic sensor , the arduino is programmed for the sensor and the buzzer and vibration helps to walk freely without colliding.

## II. LITERATURE REVIEW

In the past few years, there were many innovations tried for guiding visually impaired people for their independent and free movement in the surrounding without any other individual support.

Our project is influenced by the stick which is used by the blind people while walking. Many obstacle detection technologies like infrared sensors, ultrasonic sensors, light sensors, vibration sensor and others where used to determine the distance of the object.

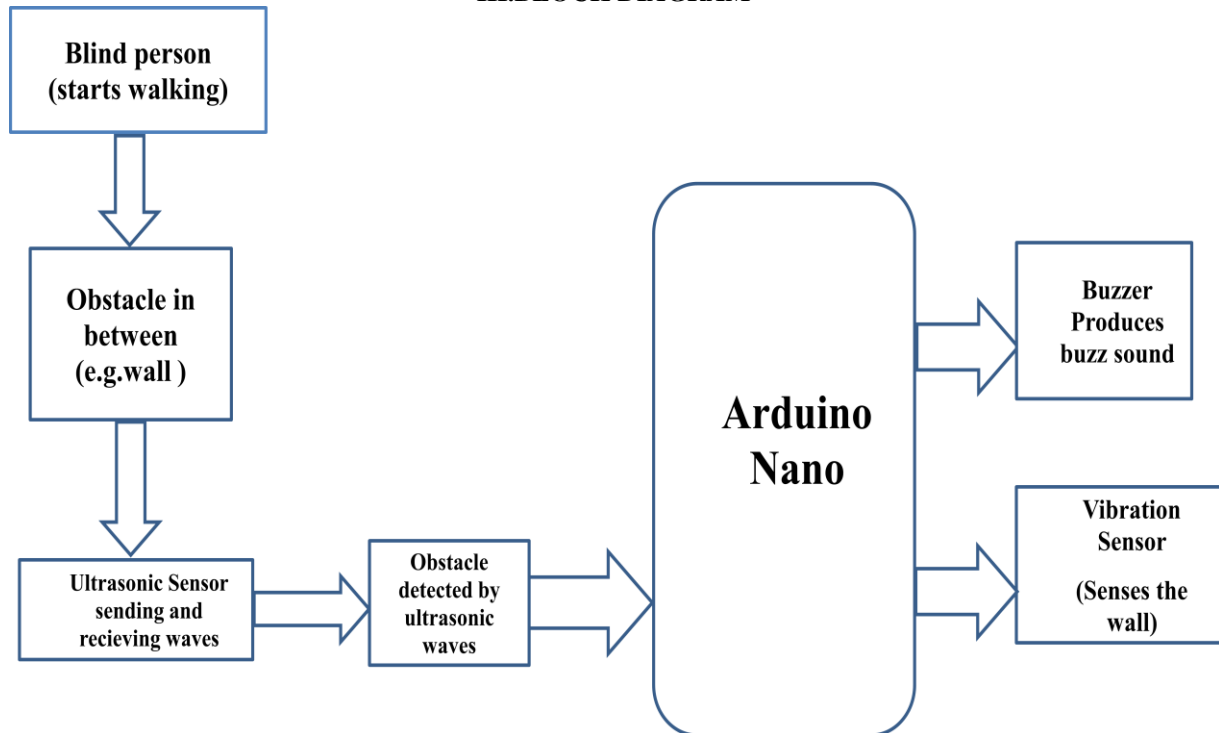
Some past works are explained below:

I.Ms Pooja Sharma[6]- She analysed that object can be detected ,but there are drawbacks in terms of angle and distance. On the other hand, third eye for blind has a wide angle for the detection which can be widened with respect to the range of the sensor.

II.Hugo Fernandesc, JoãoBarroso Blind Guide “An ultrasound sensor based body area network for guiding blind people”. The research introduces supportive formula for sensing obstacles for the sightless persons who generally take help of white-cane or the pet dog, thus for the detection of obstacles by using this device provides a proper solution to the blinds. But carrying the cane and pet dog becomes difficult.

III.M.A Ungar S[5], He proposed methods for the unsighted people of urban areas. But they didn’t consider the people who cannot afford equipments of high cost. This drawback overcomes in Third eye for blind.

### III.BLOCK DIAGRAM



### IV.COMPONENTS USED

- 1.Arduino nano
- 2.Ultrasonic sensor
- 3.Buzzer
- 4.PCB
- 5.Vibration sensor
- 6.Battery cap
- 7.Battery
- 8.Soldering wire
- 9.Soldering iron
- 10.Connecting wire

**1.Arduino nano-** It is a microcontroller board with a USB programming interface to connect to a computer and additional connection socket to external electronics like sensor, motor, speakers etc. It has 14 digital input-output pins (0-13), 6 analog inputs(A0-A5), a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. They are typically programmed by programming languages C and C++. It has the operating voltage of 5V.

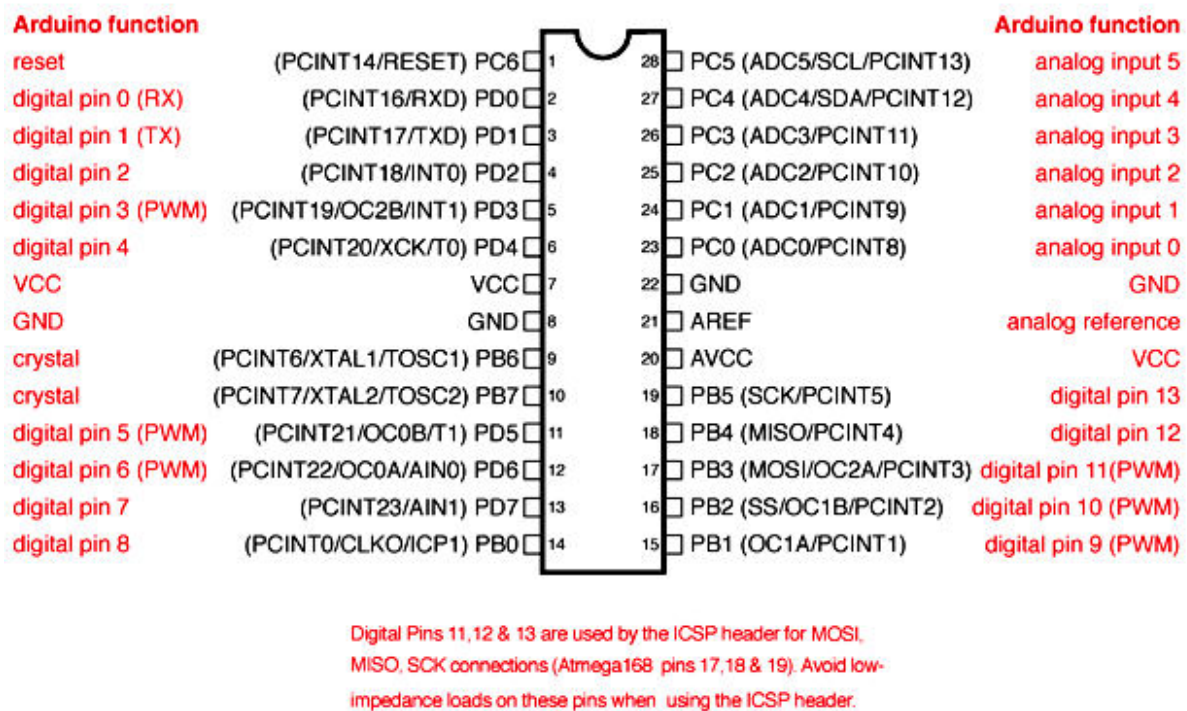


Figure1.Pin diagram of Arduino nano

**2.Ultrasonic sensor-** It measures the distance to an object using ultrasonic sound waves. It uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. They are mainly used in range of 40-70kHz. For example, at 58 kHz, a commonly used frequency, the measurement resolution is 1 centimetre (cm), and range is up to 11 meters having an ultrasonic element alternate between emitting and receiving signals.

**3.Buzzer-** A buzzer is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. It convert audio signal into sound signal. Operating voltage of buzzer is 1.5 to 24 V.

**4.PCB-** Printed circuit boards (PCBs) are the boards that are used as the base in most electronics. It provide physical support as wells as wiring area.

**5.Vibration sensor-** Vibration sensors are sensors for measuring, displaying, and analyzing linear velocity, displacement and proximity, or acceleration. The sensitivity of these sensors normally ranges from 10 mV/g to 100 mV/g.

**6.Battery-** Battery is an energy storage device consisting of two or more electrochemical cells that convert stored chemical energy into electrical energy and used as a source of power. When a battery is supplying power, the positive terminal is cathode and negative terminal is anode. We are using 9V battery.

**7.Connecting wire-** Connecting wires allows an electrical current to travel from one point on a circuit to another. Most of the connecting wires are made up of copper or aluminum. Copper is cheap and has good conductivity.

## V.PROCEDURE

This proposed system consists components like Arduino nano, ultrasonic sensor, PCB, vibration sensor, buzzers for detecting the obstacles and letting the user know about the obstacle, red LEDs, switches, cable, male and female header pins, 9V battery, some elastic and stickers to make the device wearable as a band.

The ground of LED, buzzer and vibration sensor are connected to GND of the arduino. The +ve of the LED and the middle leg of switch is connected to the arduino pin 5. The +ve of the Buzzer is wired to the first leg of the switch and the +ve of the vibration sensor is wired to the third leg of the switch.

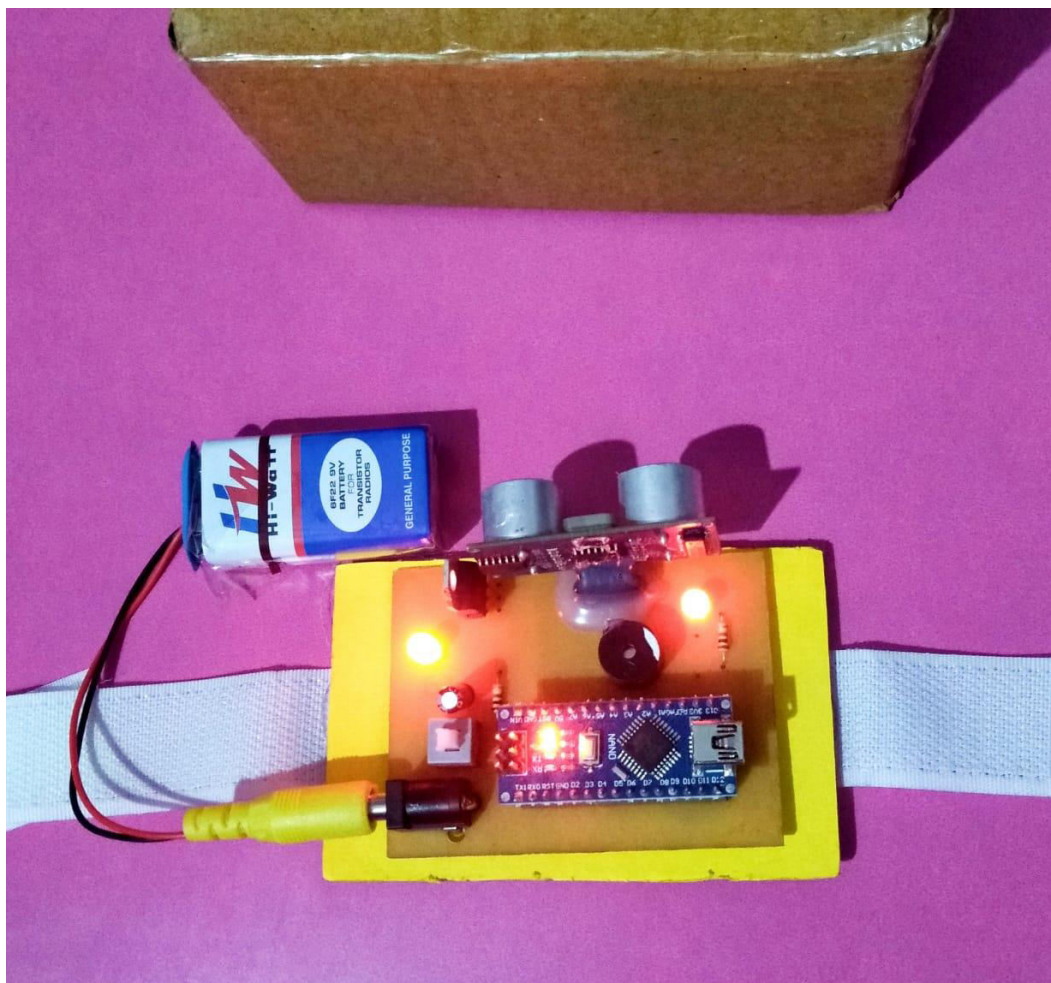


The ultrasonic sensor is wired accordingly. The ultrasonic sensor pin VCC is connected to the arduino pin VCC, ultrasonic sensor pin GND is connected to the arduino pin GND, ultrasonic sensor pin trig is attached to the arduino pin 12, ultrasonic sensor pin echo is connected to the arduino PIN 12. The switch used here is for selecting the mode (buzzer or vibration mode.)

All the components are connected on the PCB and the soldering is done. A 9V battery is connected. At last all the connections is done to the arduino and the coding is uploaded in the arduino.

## VI.WORKING

### THIRD EYE PROJECT USING ARDUINO-



The ultrasonic sensor is a transducer, and is used in pair as trans receiver. The transmitter emits the ultrasonic waves and if obstacles are present in the path, the ultrasonic sensor waves hits the obstacles and gets reflected back, the reflected wave is received by the receiver. The ultrasonic sensor is a combination of one transmitter and receiver. The time interval between sending and receiving of the ultrasonic signal is calculated, this time interval is used to calculate the distance between sensor and the obstacle.

Sensors has a field view of about 60 degrees for 4 feet distance, as the distance from the sensor increases, the coverage angle decreases. Thus, the objective is to cover a wide angle to detect the obstacles with the help of the ultrasonic sensors to help the blind and make it easy for them to move around easily without any hassle.

Hence, the distance is calculated, the sensor detects and the further procedure of the buzz sound to the user is carried out. Thus, in this way Third Eye for Blind will be designed for the visually impaired people and will make it very easy and convenient as it will be a wearable device and it will help the user in travelling and detecting the obstacles while walking.

## VII.ADVANTAGES

- 1.It is easy to carry and operate.
- 2.It is economical.
- 3.It is small and light in weight.
- 4.Easy to fit with caps, shoes, hand band.
- 5.It can detect obstacle by ultrasonic sensor and produce buzz sound which make it easy for the blind people .
- 6.Easy to identify the location or movement of objects and people.
- 7.In case of emergency interaction like suddenly coming in front of a vehicle or in any other circumstances when interaction cannot be avoidable by using this device the users can maintain a safe distance from each other. The alarming system of device warns the human when they cross the threshold minimum safe distance.

## VIII.RESULT

This project is designed to ensure the obstacle detection near to 1 meter distance. The blind persons will be able to walk freely without any kind of help.

Therefore, they can easily detect the distance of obstacles. Of course, using wearables is not the only solution that should be implemented. Along with wearing the device, the person should also be given a proper training.

This device responds to the user in all the circumstances with the use of the ultrasonic sensors and the arduino board which makes it easy to operate.

## IX.CONCLUSION

Thus, this project proposed the design and architecture of a new concept of arduino based distancing device. A simple, cheap, efficient, easy to carry, configurable, easy to handle electronic guidance system with many more amazing properties and advantages is proposed to the people who are visually impaired. The system will be efficient and unique in its capability in specifying the source and distance of the other people around in public places. It is able to detect the people and object in the areas like left, right, and in front of the

person using this device. If this project is constructed with at most accuracy, the blind will be able to move from one place to another without others help.

Thus, the project as a whole was successful in developing a more durable navigation technique apart from the existing ones. This was just a prototype of the original idea that had to be presented here. The project, if used on a wider scale, really has the ability to make an impact to the community.

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