

Design and implementation of Real-Time Obstacle detection device

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Abstract: - This is an object detection type of device with the help of which we can detect the object. In this firstly, the device detects the obstacles and then the information of the obstacles sends to the visually impaired people by using different modalities such as vibration and beep sound [1].

KEYWORDS: - BUZZER, ARDUINO NANO, ULTRASONIC SENSOR...

1. INTRODUCTION

We know how difficult is for blind people so this device can make their life easy and they don't need to be dependent on others.

This project makes their life easy. They could use this as a tool or a hand held device that detects the obstruction. This device is very cost effective and economical. And we use Arduino NANO device to execute this functioning [4]. By using this tool or equipment, users can quickly determine whether something is in front of them by hearing the buzzer sound (beep). A Ultrasonic sensor are also attached with that having higher detection range and they can move independently with a greater accuracy [5].

2. REAL-TIME OBSTACLE DETECTOR DEVICE

Figure 2.1 gives the overview of the working model. It deals with the accurate and comprehensive coverage of obstacle detection[2,3]. The following devices are used to design this device are as follow: -

1. Arduino NANO
2. Female Header
3. Breadboard
4. Buzzer
5. Male Header
6. LED: Red
7. Ultrasonic sensor
8. Female Header
9. Jumper wires
10. Battery

In the coming section we are going to explain the few components which play an important part to complete the model.

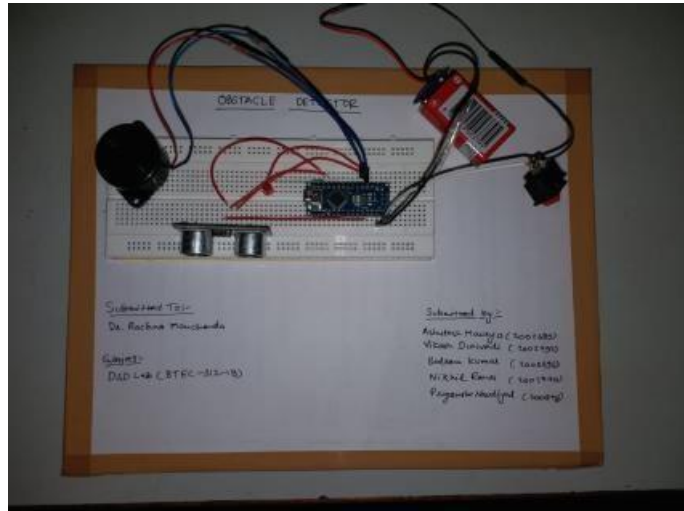


Figure 2.1. Project at final stage

1. ARDIUNO NANO



Figure 2.1.1 Arduno Board

Figure 2.1.1 displays an Arduino board which is an open-source hardware and software company. It is based on easy-to-use hardware and software operations on it. It is small and breadboard friendly board that are based on the AT mega 328. These microcontroller devices aid in the sensing and management of things in real-time environments and circumstances. Its weight is 7g and has 22 digital input/ output pins. The codes are written in this are through with C++ addition with function and methods.

2. ULTRASONIC SENSOR



Figure 2.1.2 Ultrasonic Sensor

Figure 2.1.2 displays an ultrasonic sensor. It is made up of a transceiver, receiver, and transmitter. In the transmitter, electrical signals are transformed into sound waves. Sound waves are again converted into electrical signals by the receiver. Both sending and receiving tasks are handled by the transceiver. Additionally, it contains crystal oscillators. It will carry out the Stabilizing procedure. By sending out ultrasonic sound waves, an ultrasonic sensor can estimate an object's distance.

3. JUMPER CABLES



Figure 2.1.3 Jumper Cables

Figure 2.1.3 displays Jumper wires (du point), which are used to connect devices, are another name for the jump wires. It is an electric wire. We can make easy connections with the other devices through this. It has the pin on both sides. These are used for the connection between the non-corresponding device and the breadboard.

4. PIEZO BUZZER

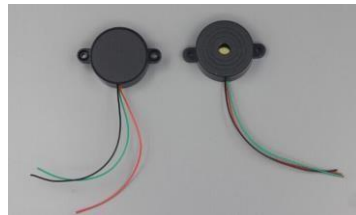


Figure 2.1.4 Piezo Buzzer

Figure 2.1.4 displays a piezo buzzer. A tone, sound, and alarm are produced by the electronic gadget via which they are produced. As an indication, it is utilized. Piezoelectricity serves as its foundation. Jacques and Pierre Curie in 1880 discovered this concept. It works on using a piezo crystal, a type of material changes its shape when we applied voltage on it. When the crystal squeezes against a diaphragm, like a tiny speaker, it gives rise to a pressure wave (sound) which the human ear picks.

WORKING PRINCIPLE: -

This system is built of the apparatus like bread board, Ultrasonic sensor, buzzers, Arduino NANO, Sensors for detecting the hurdles (obstacles). Using this, the user becomes aware of the impediment. Male and female header pins, Jumper wire, a power bank, some stickers, and elastic are used to assemble the device into a band that users can wear [1].

The Arduino's ground is wired into the buzzer's ground. It makes sense to wire the ultrasonic sensor in this way. Pin for a sonar sensor: The Arduino's PIN 6 is connected to an Echo pin-like ultrasonic sensor. The ultrasonic pin VCC is connected to the ultrasonic pin GND, and the Arduino pin GND is connected to the Arduino pin GND. Pin for a sonar sensor Trig is connected to an Arduino pin, and the switch used in this case is to choose the node. Finally, after all of the connections to the audio board have been made, upload the code to the Arduino board, power the other modules, and utilize a power bank for the power supply. A transmitter is used with the ultrasonic sensor. The transmitter released ultrasonic waves when the thing was discovered. The transmitter and receiver were both sent through the ultrasonic speaker. We determine the time interval and also the distance between the transmitter signal and receiver signal by using this.

3. REFERENCES

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Biographies

Author Name: - All student the members are pursuing bachelor of technology degree Chandigarh Engineering college, Landran, Mohali. Mentors are expertise in their own fields and core interested subjects (topics). All members are played an important role in the building of this project.