

Barrier and Potholes Detection Smart Vehicle

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ABSTRACT

This project is designed to build a smart vehicle which can sense barrier and potholes using ultrasonic sensor. As now a days we can see that road accidents are major issue in today fast moving life, and to avoid these collisions and accidents the road breaker and traffic police wardens are controlling the flow of traffic, but even if the person is capable of following all the traffic rules there are some situations like sometimes the weather conditions abruptly changes and driver cannot control the vehicle and another uncontrollable situation is that sometime the driver might feel sleepy during the driving and hence leads to collision. This project is mainly designed to overcome above mentioned conditions, and can help in degrading the chances of road accidents.

Keywords: Smart vehicle, Road, robotics

OBJECTIVE

Now a days Robotics is an interesting and fast growing field. Being a branch of engineering, the presentations of robotics are growing with the progression of technology. Robots are more efficient when they perform autonomously and without human interaction.

Our project Barrier and Potholes Detecting Smart Vehicle can be considered as central issue in designing mobile robots, the technology used in this project helps to transverse in unfamiliar environments without damaging itself. In this project our smart vehicle will automatically sense the obstacle in its way and avoid it by changing the direction. It is designed as a two wheeled car having a board at its top and ultrasonic sensor at the front to avoid the obstacles. Whenever our smart vehicle senses any barrier it automatically changes its direction and gives signal. This smart

vehicle does not require any external control and will operate effectively in unknown environments.[1-5]

APPLICATIONS

- Obstacle avoiding robots can be used in almost all mobile robot navigation systems.
- They can be used for household work like automatic vacuum cleaning.
- They can also be used in risky environments, where human penetration could be lethal.
- Adding more sensor to monitor other environmental parameters such as CO₂, Pressure, and Oxygen Sensor
- In aircraft, navigation, and military there is a great possibility of this real-time system.
- It can also be implemented in hospitals or medical institutes for the research & study in "Effect of Weather on Health

and Diseases”, hence providing better precaution alerts

HARDWARE/ SOFTWARE USED

- Arduino
- Motor driver
- Servo motor
- Ultrasonic sensor
- Wheels-4
- Gear motor-4
- 18650 cylindrical li-ion battery-2
- Wires
- Wooden/plastic platform
- Bluetooth receiver
- Glue gun
- Battery holder
- Wifi Module
- Dust Sensor
- LDR sensor
- Regulator

APPLICABILITY

On larger scale this project can be used in everyday life by implementing them in regular cars.

FUTURE IMPLEMENTATION

This model was a very simple one, saving both time and money, and evidently

validates the idea we had. For improved and more precise results, preferable three ultrasonic sensors can be used for a extensive field of view, to cover a greater region. Alternatively, an ultrasonic sensor on a rotating servo motor can also be used to sweep through a larger coverage area. Also, we can also add a technology in which this smart vehicle can sense and monitor the weather conditions, this feature can also help military organizations to carry out many dangerous jobs that cannot be complete by any soldiers.

CONCLUSION

Barrier and Pothole Sensing Smart Vehicle is an intelligent model that can automatically sense the obstacle in front of it and avoid them by turning itself in another direction. This design permits the robot to navigate in an unknown environment by evading collisions, which is a chief requirement for any autonomous mobile robot. The application of the Obstacle Avoiding robot is not limited, they can be used for household work like automatic vaccum cleaning plus this model can be operated in unknown environment without any external controlling.

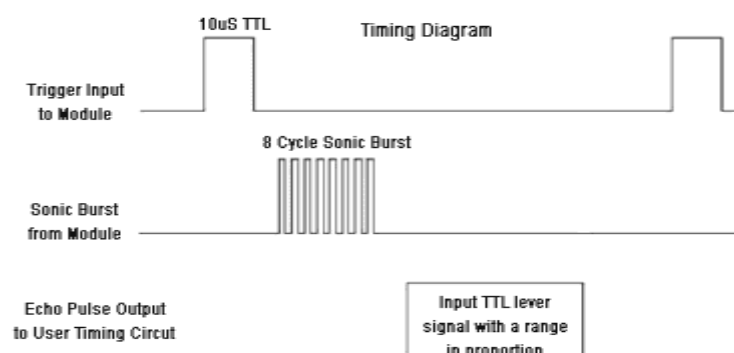


Fig. 1: Signal Diagram.

HOW SENSING WORKS?

Before going to build the robot, it is important to understand how the ultrasonic

sensor works because this sensor will have an important role in detecting obstacles.

The basic principle behind the working of ultrasonic sensors is to note down the time taken by the sensor to transmit ultrasonic beams and receive the ultrasonic beams

after hitting the surface. Then extra the distance is calculated using the formula. In this scheme, the broadly available Ultrasonic Sensor is used.

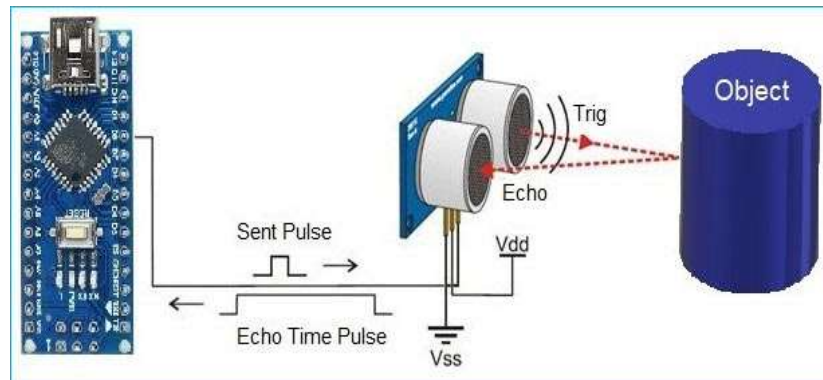


Fig. 2: Ultrasonic Sensors.

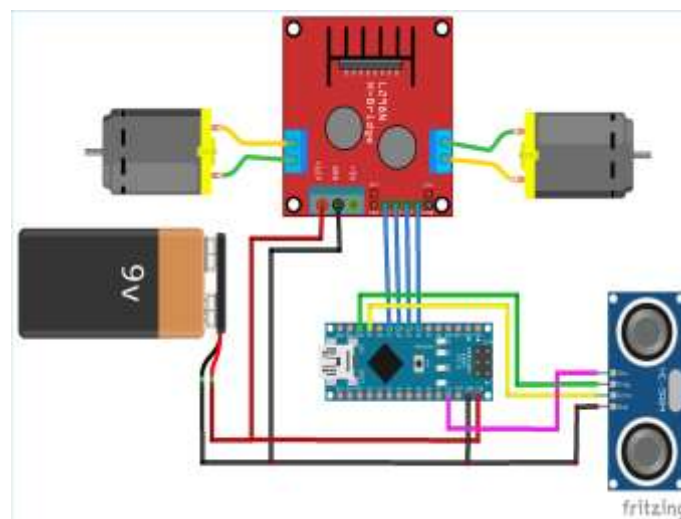
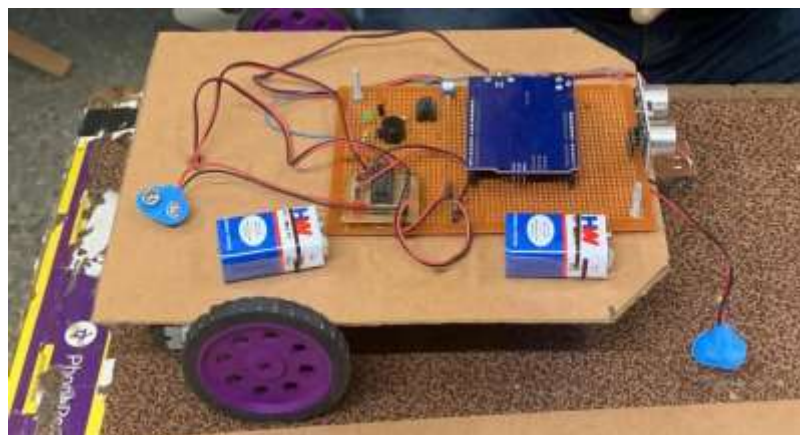


Fig. 3: Circuit Diagram.

RESULTS



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