Project Report of

IOT based Obstacle Avoiding Car

Submitted by

Rohan Saini 2017537

in the partial fulfillment of the
requirements for the award of the degree of

B.Tech (CST)

Semester III

2021-22

Department of Computer Science & Engineering
GRAPHIC ERA DEEMED TO BE UNIVERSITY, DEHRADUN

CERTIFICATE

University Roll No: 2017537   **Class Roll No:** 15

This is to certify that Project Report entitled " *IOT based Obstacle Avoiding Car* " which is submitted by **Rohan Saini** in partial fulfillment of these requirements at the **3rd Semester of B.Tech (CST)** Degree Course prescribed by the Graphic Era University during the year **2021-22** is a record of the candidate's own work carried out by him under my/our supervision.

Date:

Faculty Signature

Mr. Piyush Agarwal
Assistant Professor
C.S.E Department

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Objective

The main aim of this system is to developing a technology for vehicle by which vehicles can avoid obstacle that are coming in their path without any human activity.

1.2 Overview

The topic of my project is IOT based Obstacle Avoiding Car. I intend to design a System which can give instruction to car's wheel to turn either left or right. By such type of technology we can manufactured a car which do not need a driver for driving a car. And that will be very convenience for human being for driving a car, basically there will be no need to drive. That time we will be sit in the car and the technology that is involved in that car would handling the staring.

But the technology that I used in my project is not enough for developing such type of a original car. I am giving a demo by my project. In this project the car run straight forward , if any obstacle come in their path it monitor that in which direction path is more clear and turn in that direction.

1.3 Why this Project?

As the human is developing the technology he needs convenience in ever field. So he also need some more technology in their day to day life. Like in car, human wants that without any activity the car run. For solving this problem I create a model. And by improving that model we can invent that such type of car.

1.2 Methodology Used- Big Bang Model

This News Portal project follows the Big Ban model. This model is ideal for small projects with one or two developers working together and is also useful for academic or practice projects. Easy to manage and no formal procedures are required, Few resources required. Most important It is a good learning aid for newcomers or students. Database and design changed as per requirement .

It is recommended to go for the Big Bang model only due to the following cases i.e.

1. Developing a project for learning purposes or experiment purposes.
2. No clarity on the requirements from the user side.
3. When newer requirements need to be implemented immediately.
4. Changing requirements based on the current developing product outcome.
5. No strict guideline on product release or delivery date.

Fig 1.1 *Big Bang Model*

CHAPTER 2
TOOLS USED

2.1   HARDWARE USED

2.1.1 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. High-frequency sound waves reflect from boundaries to produce distinct echo patterns. Ultrasonic sensors work by sending out a sound wave at a frequency above the range of human hearing. The transducer of the sensor acts as a microphone to receive and send the ultrasonic sound

Fig 2.1.1: Ultrasonic Sensor

2.1.2 Arduino Uno

ESP8266 is a highly integrated chip designed for the needs of a new connected world. It offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor. It is Arduino compatible, works great with the latest Arduino IDE/Mongoose IoT Micropython. NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.

Fig 2.1.2 Arduino Uno

2.1.3 L293D Motor Driver Module

L293d IC is known as a motor driver. It is a low voltage operating device like other ICs. The other ICs could have the same functions like L293d but they cannot provide the high voltage to the motor. L293d provides the continuous bidirectional Direct Current to the Motor. The Polarity of current can change at any time without affecting the whole IC or any other device in the circuit. L293d has an internal H-bridge installed for two motors.

H-Bridge is an electrical circuit that enables the load in a bidirectional way. L293d bridge is controlled by external low voltage signals. It may be small in size, but its power output capacity is higher than our expectation. It could control any DC motor speed and direction with a voltage range of 4.5 – 36 Volts. Its diodes also save the controlling device and IC from back EMF. To control the max 600mA amount of current an internal ″Darlington transistor sink″ installed in it, which could be used to control a large amount of current by providing a small amount of current. It has also internal

"pseudo-Darlington source" which amplifies the input signal to control the high voltage DC motor without any interception.

2.1.4 Dc Motor

I use four 12 V DC motor which helps to rotate the wheel. For handling these motor there is motor driver. DC motor is a device which convert electric energy into mechanical energy. Through the motor driver we supply power to the motors. And according to the instruction of the code motor driver change these motor's polarity for spin in both direction.

Fig 2.1.4 DC Motor

2.1.5 Servo Motor

Brig A servo motor is an electromechanical device that produce torque and velocity based on the supplied current and voltage. A servo motor works as part of a closed loops system, which is comprised of a motor. Feedback device, and servo providing important feedback on aspects such as position, velocity or torque

Fig 2.1.5 Servo Motor.

2.2   ARDUINO IDE

Arduino IDE(Integrated Development Environment) is the software for Arduino. It is a text editor like a notepad with different features. It is used for writing code, compiling the code to check if any errors are there and uploading the code to the Arduino. It is a cross-platform software which is available for every Operating System like Windows, Linux, macOS.

CHAPTER 3
WORKING PRINCIPLE

3.1   Connection
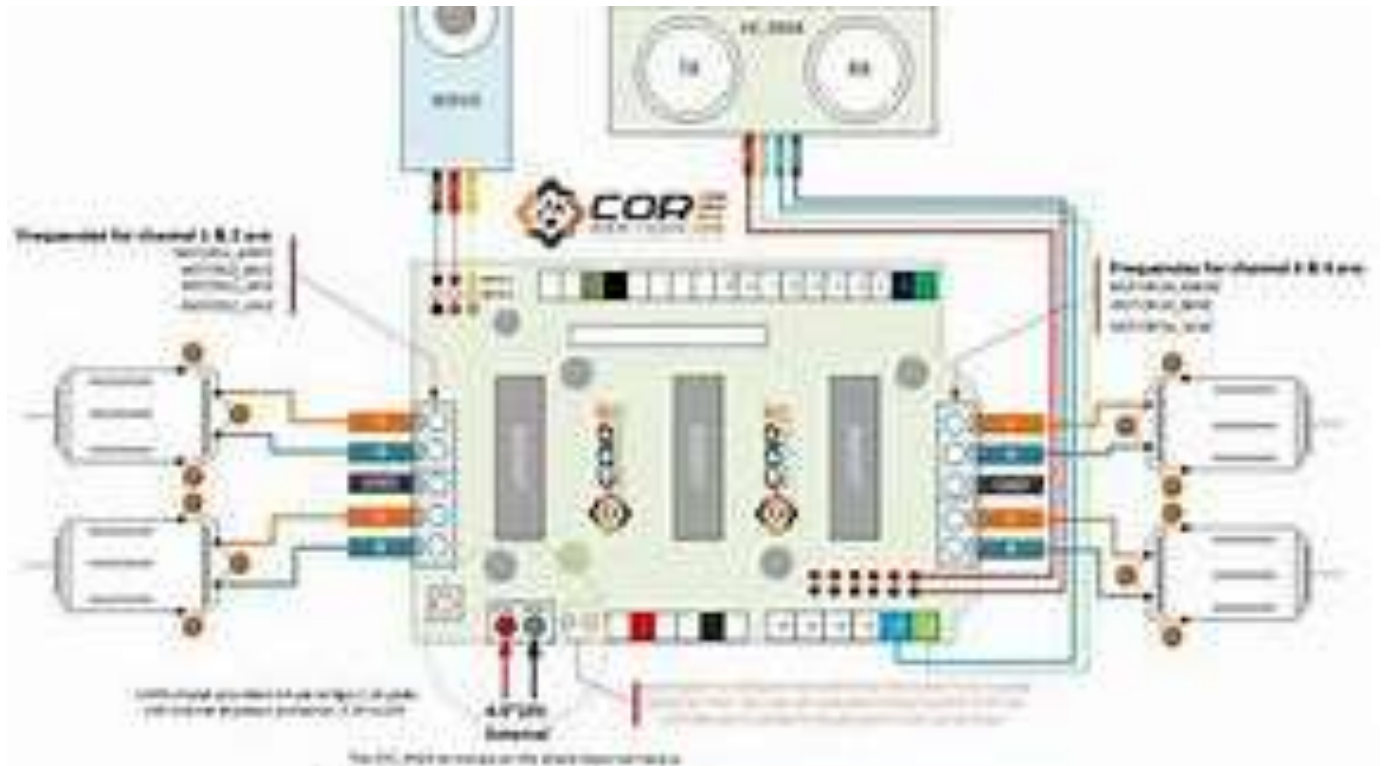
Fig 3.1: Connection Diagram

3.2   Working

The Ultrasonic Sensor emits an ultrasound of 40000 hz which travels through the air and it will bounce back after strike from an obstacle. Arduino consider the travel time and speed of the sound and calculate the distance.

If the distance is less than stopping distance that is already declared in code by the devloper, the car will stope. The ultrasonic senor emits the sound wave in both direction one by one and receive the waves. Arduino take as input from the sensor and calculate the distance of both direction. Arduino compare the both distances and which distance will greater than other one, in that direction car will turn. And would run in straight direction.

CHAPTER 4
RESULT & CONCLUSION

4.1   Results

4.2   Conclusion

By this project we can conclude that we can develop a mind for car by which used it can run without human mind or without human's help. The car can take decision by its own, it can decide in which direction it should turn.

REFERENCES

1. Youtube video
   https://youtu.be/XbACt9zK9Vk