

OBSTACLE AVOIDING CAR

Overview

An obstacle-avoiding car is an autonomous vehicle designed to detect and navigate around obstacles in its path, ensuring smooth and safe movement. It typically utilizes a combination of sensors such as ultrasonic, infrared, or LiDAR to sense objects and evaluate the surrounding environment. The car is equipped with an onboard control system that processes the sensor data, calculates the optimal route, and adjusts the vehicle's speed and direction to avoid collisions. These cars are often used in robotics, automation, and even experimental projects, showcasing key elements of autonomous navigation, path planning, and real-time decision-making.

Components Required to build an obstacle avoiding car:

- CH32V003x Board (VSD Squadron Mini RISC-V Board)
- Ultrasonic Sensor
- Servo Motor
- L298N Motor Driver
- DC Motors
- Power Supply
- DIY Car Kit

Circuit Connection for an obstacle avoiding car

The circuit for an obstacle-avoiding car using the CH32V003 board involves several key components that enable the vehicle to detect obstacles and navigate around them autonomously. The sensor setup uses an ultrasonic module, with the TRIGGER_PIN connected to GPIO_Pin_4 and the ECHO_PIN to GPIO_Pin_3 of the CH32V003 board. These pins control the sending and receiving of signals from the ultrasonic sensor to measure the distance to nearby objects. If the detected distance is less than the defined OBSTACLE_THRESHOLD (70 cm), the system triggers corrective actions to avoid collision.

In addition to the ultrasonic sensor, the circuit includes a servo motor and two DC motors for movement control. The `SERVO_PWM_PIN` (`GPIO_Pin_2`) is used to control the steering servo, adjusting the car's direction. The motors are connected to specific GPIO pins for forward and reverse movement: `MOTOR_A_FORWARD` (`GPIO_Pin_5`) and `MOTOR_A_REVERSE` (`GPIO_Pin_6`) control the left motor, while `MOTOR_B_FORWARD` (`GPIO_Pin_7`) and `MOTOR_B_REVERSE` (`GPIO_Pin_0`) control the right motor. The system processes input from the ultrasonic sensor and uses PWM signals to adjust the motor speeds accordingly, allowing the car to navigate around obstacles effectively.

Pinout Diagram for an obstacle avoiding car

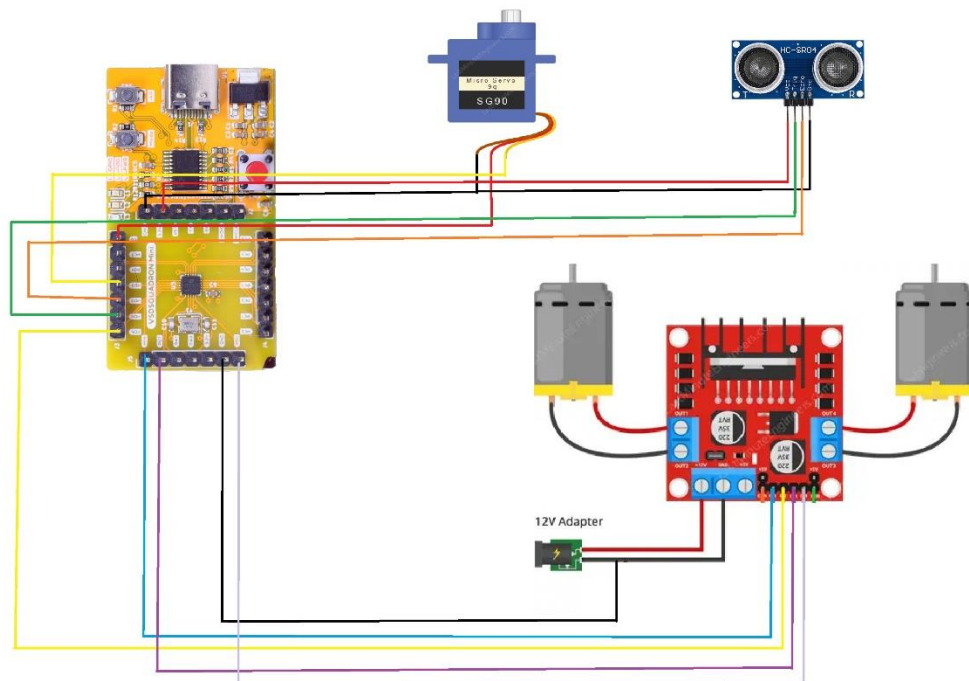


Table for Pin connection:

Servo Motor	CH32V003x
VCC	5V
GND	GND
Control	PD2

Ultrasonic Sensor	CH32V003x
VCC	5V
GND	GND
Trigger	PD4
Echo	PD3

L298n Driver	CH32V003x
ENA	5V
ENB	GND
IN1	PD5
IN2	PD6
IN3	PD7
IN4	PD0