# ARDUINO OBSTACLE AVOIDING CAR

## PROBLEM STATEMENT

In today's world, collisions and accidents caused by human error are a major concern in transportation and automation. There is a growing need for smart, self-operating vehicles that can navigate safely without manual control. Our obstacle-avoiding car addresses this issue by using sensors and intelligent algorithms to detect and avoid obstacles in real time. This innovation can be applied to robotics, self-driving vehicles, and automated delivery systems, making mobility safer and more efficient. By integrating AI and automation, our project aims to reduce accidents, enhance navigation, and contribute to the future of smart transportation.

## PROJECT OVERVIEW

The Obstacle-Avoiding Car requires Arduino Uno for control, ultrasonic sensor for obstacle detection, servo motor to scan surroundings, DC motors for movement, and a motor driver to regulate speed and direction. It runs on a battery pack, with jumper wires for connections and LED indicators for status. The software includes Arduino IDE for coding, AFMotor for motor control, NewPing for sensor accuracy, and Servo Library for motor movement, all programmed in C++ to ensure smooth and efficient operation.

## SOLUTION OFFERED

Our obstacle-avoiding car provides an intelligent and autonomous navigation system that enhances safety and efficiency. By using an Arduino UNO, ultrasonic sensors, and an L293D motor driver, the vehicle detects obstacles in real time and adjusts its movement accordingly. This innovation reduces human intervention, minimizes accidents, and improves automation in robotics and transportation. With applications in smart vehicles, industrial automation, and rescue operations, our project paves the way for a future of safer and smarter mobility solutions.

## WHO ARE THE END USERS?

Autonomous Vehicle

Industry Military & Surveillance Operations

Public Transport & Smart Cities

## TECHNOLOGY

**Hardware Requirements:**

Arduino Uno – Controls all components and processes sensor data.

Ultrasonic Sensor (HC-SR04) – Detects obstacles and measures distance.

Servo Motor – Rotates the ultrasonic sensor to scan surroundings.

DC Motors (4x) – Enables movement in all directions.

Motor Driver (L293D) – Controls motor speed and direction.

Wheels & Chassis – Provides structural support and movement.

Lithium Battery (3.7V each) – Powers the system.

Jumper Wires, Switches & LED Indicators – Connect components and provide control/status feedback.

**Software Requirements:**

Arduino IDE – For coding and uploading programs.

AFMotor Library – Controls DC motors.

NewPing Library – Enables accurate obstacle detection.

Servo Library – Manages servo motor rotation.

C++ Programming – Used for writing Arduino code.