

# Arduino-Based Voice Controlled Car Project

## 1. Introduction:

The Arduino-Based Voice Controlled Car is a smart vehicle prototype that can be controlled using voice commands. This project combines the power of Arduino microcontroller with voice recognition technology to offer a hands-free method of controlling a robotic car. It has applications in assistive technologies, smart transportation, and robotics education.

## 2. Objective:

The main objective of this project is to design and develop a robotic car that moves according to voice commands given by the user. This helps in understanding the integration of voice modules with microcontrollers and controlling motors using Arduino.

## 3. Components Required:

- Arduino Uno
- Motor Driver Module (L298N)
- Bluetooth Module (HC-05 or HC-06)
- Voice Recognition Module or Smartphone with Voice Control App
- 2 DC Motors with Wheels
- Chassis Board
- 9V Battery or Battery Pack
- Jumper Wires
- Breadboard (Optional)

## 4. Working Principle:

- The voice commands are given via a smartphone app or a dedicated voice recognition module.
- The Bluetooth module receives the voice command in the form of text and sends it to the Arduino.

- The Arduino processes the command and drives the motor driver module accordingly.
- The motor driver then controls the motors to move the car in the specified direction.

#### 5. Voice Commands Examples:

- "Forward" - The car moves forward
- "Backward" - The car moves backward
- "Left" - The car turns left
- "Right" - The car turns right
- "Stop" - The car stops

#### 6. Circuit Diagram Explanation:

- The Bluetooth module's TX and RX pins are connected to Arduino's RX and TX (via voltage divider if needed).
- The motor driver is connected to Arduino's digital pins (e.g., D3, D4, D5, D6) to control the motors.
- Motors are powered through the motor driver using a 9V battery.
- Arduino is powered either through USB or external supply.

#### 7. Arduino Code Overview:

- The Arduino is programmed to read the input from the Bluetooth module.
- A set of if or switch statements is used to match the received command and trigger the respective motor actions.

#### 8. Advantages:

- Hands-free control of the car
- Good learning experience in robotics and embedded systems
- Can be expanded with obstacle detection or GPS

## 9. Applications:

- Smart mobility aids for disabled people
- Educational robotics
- DIY hobby projects

## 10. Conclusion:

The Voice Controlled Car using Arduino is an exciting and educational project that teaches various concepts such as microcontroller programming, motor interfacing, and wireless communication. It can be further enhanced with features like voice feedback, obstacle avoidance, and smartphone app integration.