

# VOICE CONTROLLER ROBOT CAR

Aditya Jadhav<sup>1</sup> | Priyanka Mane<sup>2</sup> | Rupali Bembade<sup>3</sup> | Shubham Swami<sup>4</sup> | Yerate Anjali<sup>5</sup>

<sup>1</sup>Electronics and Telecommunication Engineering & Vishweshwarayya Abhyantriki Padvika Mahavidyalaya <sup>2</sup>Electronics and Telecommunication Engineering & Vishweshwarayya Abhyantriki Padvika Mahavidyalaya <sup>3</sup>Electronics and Telecommunication Engineering & Vishweshwarayya Abhyantriki Padvika Mahavidyalaya <sup>4</sup>Electronics and Telecommunication Engineering & Vishweshwarayya Abhyantriki Padvika Mahavidyalaya <sup>5</sup>Electronics and Telecommunication Engineering & Vishweshwarayya Abhyantriki Padvika Mahavidyalaya

## ABSTRACT

A voice-controlled robotic car project utilizes voice commands, often through an Android application and Bluetooth, to control the robot's movements (forward, backward, left, right, stop) via a microcontroller and DC motors.

A voice-controlled robotic car project utilizes voice commands, often through an Android application and Bluetooth, to control the robot's movements (forward, backward, left, right, stop) via a microcontroller and DC motors.

A microcontroller, like Arduino, acts as the brain of the robotic car, interpreting the commands received from the Android application and controlling the motors.

The Android application uses voice recognition to convert spoken commands into text, which are then transmitted to the microcontroller for processing.

## INTRODUCTION

This project Voice Controlled Robotic Vehicle helps to control robot through voice commands received via android application. The integration of control unit with Bluetooth device is done to capture and read the voice commands. The robotic vehicle then operates as per the command received via android application. For this 8051 microcontroller is integrated in the system which makes it possible to operate the vehicle via android application. The controlling device may be any android based Smartphone/tab etc having an android OS. The android controlling system provides a good interactive GUI that makes it easy for the user to control the vehicle. The transmitter uses an android application required for transmitting the data.

The receiver end reads these commands and interprets them into controlling the robotic vehicle.

The android device sends commands to move the vehicle in forward, backward, right and left directions After receiving the commands, the microcontroller then operates the motors I order to move the vehicle in four directions. The communication between android device and receiver is sent as serial communication data. The microcontroller program is designed to move the motor through a motor driver IC as per the commands sent by android device.

The main objective of the project is to control the robotic vehicle in a desired position, through user voice commands by attaching a speech-recognition module as Bluetooth to the microcontroller for communication.

The proposed system consists of two blocks: transmitter block as android application like AMR voice and receiver block as Bluetooth interfaced to microcontroller of the 8051 family and a battery for power source.

An android phone is connected to the receiver (Bluetooth). A voice commands are sent from the smart phone to the receiver to control the movement of the robot either in forward, backward, left, right or stop directions.

Bluetooth is interfaced to microcontroller and the two motors are also interfaced to the microcontroller through a motor-driver IC wherein they are used to run or change the directions of the robotic vehicle.

The robot is controlled by the voice commands are sent by the smart phone –and, based on these commands –the receiver controls the directions of the robot.

Our goal is to create a robot car that can be operated by a person's voice command. These systems are sometimes referred to as Speech Controlled Automation Systems (SCAS) . The above-mentioned system is a prototype of our design. The concept is to build a robot that will be controlled by voice instructions. A mobile phone is used to control the robot; there are numerous publications that demonstrate the communication between a robot and a smart phone. For remotely automating the robot, a smart phone is an excellent interface. It has a lot of features that can be useful. For the needed work, an android application with a microcontroller is employed in this design.

## METHODOLOGY

voice-controlled robotic car typically uses a system where voice commands are captured, processed, and translated into actions that control the car's movement, often involving a smartphone app, Bluetooth communication, and a microcontroller.

Here's a breakdown of the methodology:

1. Voice Command Capture and Processing:  
Microphone:

A microphone on a smartphone or a dedicated device captures the user's voice commands.

Speech Recognition:

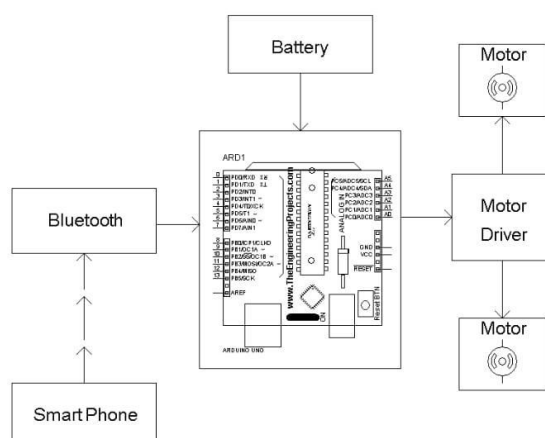
Speech recognition software (often built into the smartphone app or a dedicated module) analyzes the captured voice and converts it into text or digital commands.

Command Interpretation:

The system interprets the commands (e.g., "forward", "backward", "left", "right") and translates them into appropriate actions for the robotic car.

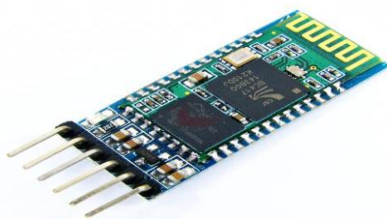
2. Communication and Control:

## BLOCK DIAGRAM



## COMPONENTS USED

### HC-05 BLUETOOTH MODULE



It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard, and many more consumer applications.

It has a range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions.

It is IEEE 802.15.1 standardized protocol, through which one can build a wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air.

## L293D Motor Driver

This L293D Motor Driver Shield for Arduino is probably one of the most versatile on the market and features 2 servo and 4 motor connectors for DC or stepper motors. That makes it a great shield for any robotic project.

This Arduino compatible motor Driver shield is a full-featured product that it can be used to drive 4 DC motor or two 4-wire steppers and two 5v servos. It drives the DC motor and stepper with the L293D, and it drives the servo with Arduino pin9 and pin10.



L293D is a monolithic integrated, high voltage, high current, 4-channel driver. Basically, this means using this chip you can use DC motors and power supplies of up to 36 Volts, that some pretty big motors and the chip can supply a maximum current of 600mA per channel, the L293D chip is also what's known as a type of H-Bridge.

### Fingerprint Sensor

Dual Gearbox: The motor has a gearbox with two gears, which can be switched manually or automatically.

Adjustable Speed: The motor's speed can be adjusted by switching between the two gears.

High and Low Speed: The motor typically has a high-speed gear for fast movement and a low-speed gear for more precise control.

Increased Torque: The gearbox can increase the motor's torque output, making it suitable for applications that require more power.



1. Voltage: 6-24V DC
2. Current: 1-5A
3. Speed: 100-1000 RPM
4. Torque: 1-10 Nm
5. GearRatio: 1:1 to 1:100

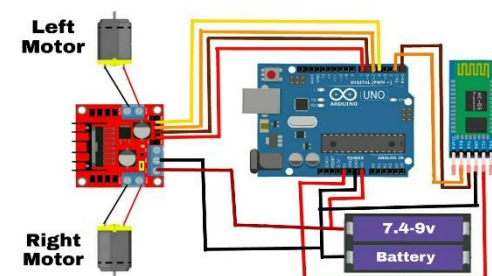
1. Maxon Motor: A leading manufacturer of high-quality DC motors, including 2-gear motors.
2. Faulhaber: A German-based company that specializes in the production of high-precision DC motors, including 2-gear motors.
3. Portescap: A global leader in the design and manufacture of DC motors, including 2-gear motors.

### Connecting Wires

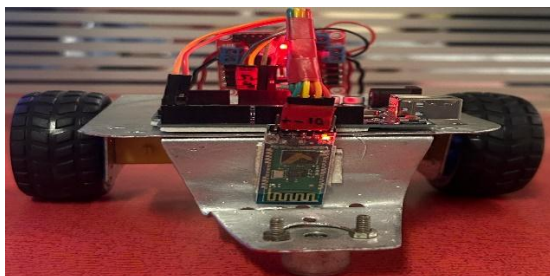
A connecting wire allows travels the electric current from one point to another point without resistivity. Resistance of connecting wire should always be near zero. Copper wires have low resistance and are therefore suitable for low resistance. Twisting the wires together and soldering is often the best method, but there are two ways of doing this. If possible, you should twist the wires in-line before soldering as this makes a stronger (and neater) join than twisting the ends together



### CIRCUIT DIAGRAM



### RESULT



When the code is uploaded in the Arduino module ,it will the connection with it Hc-05. Then we have to install the application in mobile. To provide the Commands and run the project . In the mobile application open the Bluetooth and connect with the HC-05. The result is a robot car that can be controlled using voice command .

The android app recognizes voice commands and sends them to the Arduino board via Bluetooth.

The Arduino board then interprets the command and controls the DC motors accordingly, making the robot car move or perform specific actoins like forward, reverse ,right, left etc.

As per our requirement we can controle the whole project and we can get the output.

### CONCLUSION

The voice-controlled robotic car project is a cutting-edge innovation that showcases the potential of robotics, artificial intelligence, and IoT. By integrating voice recognition technology with robotic systems, we have created a futuristic vehicle that can be controlled using voice commands.

In conclusion, the voice-controlled robotic car project represents a significant milestone in the development of innovative robotic systems. With its successful voice recognition capabilities, reliable robotic system, and user-friendly interface, this project has far-reaching implications for various fields, including assistive technology, industrial automation, education, and research.

1. Successful Voice Recognition: The project demonstrates accurate voice recognition capabilities, allowing users to control the robotic car with ease.
2. Reliable Robotic System: The robotic car's movement and actions are precise and reliable, ensuring a smooth user experience.
3. Wireless Communication: The project utilizes Bluetooth technology for wireless communication between the user's device and the robotic car.
4. User-Friendly Interface: The Android app provides an intuitive interface for users to interact with the robotic car .

### REFERENCE

- 1) <https://www.ijraset.com/research-paper/voice-controlled-robot-vehicle-using-arduino>
- 2) <https://how2electronics.com/wireless-voice-controlled-robot-car-using-arduino/>
- 3) [https://projecthub.arduino.cc/Yug\\_Ajmera/voice-controlled-car-4bce13](https://projecthub.arduino.cc/Yug_Ajmera/voice-controlled-car-4bce13)
- 4) <https://www.ijcstjournal.org/volume-11/issue-2/IJCST-V11I2P3.pdf>
- 5) <https://www.amazon.in/voice-control-robot/s?k=voice+control+robot>
- 6) [https://www.instructables.com/Arduino-Voice-Controlled-Robot/?amp\\_page=true](https://www.instructables.com/Arduino-Voice-Controlled-Robot/?amp_page=true)
- 7) <https://nevonprojects.com/voice-controlled-robotic-vehicle/>