

# **Voice Controlled Robotic Vehicle**

## **A Project Work Synopsis**

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## **Abstract**

The robot can be operated by voice commands thanks to the way this project was built. For necessary duties, an android application with a microcontroller is employed. Bluetooth technology makes it possible for the android app and the car to connect. The user can speak commands to the robot or utilise buttons on the programme to operate it. The two DC servo motors connected to the microcontroller at the receiver side enable the robot's movement. The Bluetooth RF transmitter converts the commands from the application into digital signals for a suitable range (about 100 metres) to the robot. The data is decoded at the receiver end and sent to the microcontroller, which uses it to power the required DC motors. The goal of a voice-controlled robotic vehicle is to carry out the necessary work by paying attention to the user's orders. For the user to operate the robot smoothly, a prior preparation session is required. A code is employed for the same purpose to instruct the controller.

Keywords: Robot, Design, Fabrication, Sensor, Automation

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# **1. INTRODUCTION**

## **1.1 Problem Definition**

The project's major goal is to steer the robotic vehicle in the desired direction. The project's primary goal is to provide speech or push button control of the robot. Human-robot interaction has been accomplished. The voice-controlled robot's purpose is to hear the user's commands and carry them out. A battery serves as the power supply for the proposed system, which consists of two blocks: a transmitter and a reception block. By using a personal phone and this application, we can operate the robotic car. The project is made to operate a robotic vehicle remotely using manual control and voice commands.

## **1.2 Problem Overview**

The Objective of the project is to allow the users to control the robotic vehicle remotely by voice commands. People who historically have difficulties in driving, such as disabled or old people citizens , as well the very young would be able to experience the freedom of car travel

## **1.3 Hardware Specification**

1. Chassis
2. Gear Motor
3. Wheels
4. Arduino UNO Board
5. L298D Motor Driver
6. HC05 Bluetooth module
7. Connecting Wires
8. 9V Battery
9. Breadboard

## **1.4 Software Specification**

1. Arduino IDE
2. MIT app
3. BT voice Controller App
4. Android OS

## **2. LITERATURE SURVEY**

### **2.1 Existing System**

The Arduino voice-controlled robot car is interfaced with a Bluetooth module HC-05 or HC-06. We can give specific voice commands to the robot through an Android app installed on the phone. At the receiving side, a Bluetooth transceiver module receives the commands and forwards them to the Arduino and thus the robotic car is controlled.

### **2.2 Proposed System**

There are already a lot of existing voice controlled robotic vehicle but we propose to add object recognition to the vehicle so that the risk of accidents may be lowered even more the vehicle will stop upon seeing an object in front of it or follow a line

### 2.3 Literature Review Summary (Minimum 7 articles should refer)

Year and Citation	Article/ Author	Tools/ Software	Technique	Source	Evaluation Parameter
2017, Jolad, Bhuvaneshwari, et al. "Voice controlled robotic vehicle." International Research Journal of Engineering and Technology (IRJET) 4.06	Prof. Bhuvaneshwari Jolad <sup>1</sup> , Mohnish Arora <sup>2</sup> , Rohan Ganu <sup>3</sup> , Chetan Bhatia <sup>4</sup>	Transceiver controller (MAX 232).	Microcontroller	IRJET	
2016, Surjeet and Nishu Gupta 2021 J. Phys.: Conf. Ser. 1817 012016	A Novel Voice Controlled Robotic Vehicle For Smart City Applications	Raspberry Pi	Google Assistant with IFTTT and microcontrollers	Iop.org	
2020, Saravanan, M., Selvababu, B., Jayan, A., Anand, A., & Raj, A. (2020, December). Arduino based voice controlled robot vehicle. In IOP Conference Series: Materials Science and Engineering (Vol. 993, No. 1, p. 012125). IOP Publishing.	Arduino Based Voice Controlled Robot Vehicle	Adruino UNO Board	Microcontrollers	Iop.org	

2017, Chikhale, Mr V., et al. "Voice Controlled Robotic System using Arduino Microcontroller." International Journal of New Technology and Research, vol. 3, no. 4, Apr. 2017.	Voice Controlled Robotic System using Arduino Microcontroller	Adruino UNO Board	Microcontrollers	Neliti.com	
2012, Blessington, P., Madhav, B. T. P., Babu, M. S., Reddy, R. R., Kumar, D. M., Raju, I. N., & Babu, N. A. (2012). Acoustic Controlled Robotic Vehicle. International journal of Emerging Technology & Advanced Engineering., 2(4).	Acoustic Controlled Robotic Vehicle	AT89552 microconroler	microcontrollers	Psu.edu	
2020, Srivastava, Shubh, and Rajanish Singh. "Voice controlled robot car using Arduino." International Research journal of Engineering	VOICE CONTROLLED ROBOT CAR USING ARDUINO	Arduino UNO	microcontrollers	Academia.edu	

and Technology 7.5 (2020): 4033-4037.					
2019, Diwakar, Dipesh, et al. "Voice Controlled Robotic Vehicle." (2019).	Diwakar Dipesh	L293D, Arduino UNO	Microcontrollers	Academia.e du	



### **3. PROBLEM FORMULATION**

The project's main objective is to control the robotic vehicle in a desired position. The goal of the voice-controlled Robot is to listen and act on the commands received from the user. Human Robotic Interaction is achieved.

The proposed system consists of a transmitter, a receiver block, and a battery for the power source. Using this application we can control the robotic vehicle by using a personal phone. The project is designed to control a robotic vehicle by voice commands and manual control for remote operation.

### **4. OBJECTIVES**

The objectives of a Voice Controlled Robotic Vehicle using arduino and IoT are as follows:

1. Design and development of a robotic vehicle : To meet the project requirements, the robotic vehicle should be designed and developed. The vehicle should be able to move in multiple directions, have a strong structure to hold objects, and be equipped with sensors to detect and navigate around obstacles.
2. Integration of voice control technology : To receive voice commands from an Android application, the vehicle should be outfitted with voice control technology. The technology should be capable of accurately recognizing various voice commands.
3. Development of an android application : To send voice commands to the robotic vehicle, an Android application should be created. The application should have an easy-to-use interface and be able to establish a reliable connection with the vehicle.
4. Testing and validation : To make sure that the robotic vehicle fulfils the requirements of the project, it should be properly tested. The application should be tested to ensure that it works properly, is reliable, and is compatible with the robotic vehicle.

## 5. METHODOLOGY

- Employing an Android smartphone for robot control design[1,2]. The goal of this research is to offer robust computational android platforms with more straightforward hardware architecture for robots. This essay discusses the features of Bluetooth technology, how to control a robot using a mobile device through Bluetooth communication, and the parts of the mobile and robot. It provides an overview of robots that can be moved forward, backward, left, and right using an Android application like Arduino or Bluetooth.
- Robot Operated by Smartphone Using ATMEGA328 Microcontroller [3] In this study, a robot that can be controlled by an android phone application has been created. It communicates control commands via Bluetooth, which includes several functions like regulating the motor's speed and sensing and sharing information with the phone regarding the robot's direction and distance from the closest barrier.
- Bluetooth robot controlled by an Android mobile phone using an 8051 microcontroller [4,5] A robot is often an electromechanical device that is controlled by electronic and computer programming. For manufacturing, many robots have been developed by factories all over the world and serve a purpose. This paper creates remote buttons for an Android app that may be used to control a robot's motion. Moreover, Bluetooth connection is used to link an Aroid controller to a device.

## 6.EXPERIMENTAL SETUP

The experimental setup for a voice controlled robotic vehicle using Internet of Things (IoT) would typically involve the following components:

1. **Microcontroller:** A microcontroller controls the robot's different functions, such as movement, sensor reading, and communication with the Android application. Arduino, Raspberry Pi, and STM32 are examples of popular microcontrollers used in automation. We'll be using Arduino UNO.
2. **Motor Driver:** The robot's mobility is controlled by a motor driver. It gets microcontroller signals and converts them into commands that the motors can comprehend. L298N and TB6612FNG are two common motor drivers used in automation.
3. **Motors:** Motors are used to propel the automaton in different directions. In robotics, DC motors and servo motors are widely used.
4. **Sensors:** Sensors sense the environment of the robot and provide input to the microcontroller. Ultrasonic sensors, infrared sensors, and light sensors are examples of common sensors used in automation.
5. **Android Application:** A user-friendly interface for communicating with the robot is provided by an Android programme. The application communicates with the microcontroller via voice commands, gets status updates from the robot, and shows information to the user.
6. **Power Source:** A power source is needed to supply electricity to the robot's various components. Batteries and power packs are common power sources.

## **7.CONCLUSION**

Speech recognition and a navigation system are integrated into a robotic car to assist individuals with disabilities. Even though it is quite basic, this speech control system demonstrates how speech recognition methods can be used in a control application. Our robot can respond to control commands that are spoken in a natural way and understand them. Real-time operation of the approach has been demonstrated. Simply put, this technology uses an Android software to identify human speech, convert it to text, and then process the text to direct robotic motion

## **8. TENTATIVE CHAPTER PLAN FOR THE PROPOSED WORK**

### **CHAPTER 1: INTRODUCTION**

A robotic vehicle controlled by human speech commands has been developed for this project. Robots are typically electromechanical machines that are directed by computer and electronic programming. Many manufacturing robots have been developed and can be found in factories all over the globe. Designing the most recent reversed ROBOT that can be controlled via an Android APP. In which we use Bluetooth connectivity to connect the Arduino UNO and the Android. The Arduino can communicate with the Bluetooth module via the UART mechanism. The robot's motion can be controlled using instructions received from Android. A robotic system's consistent production, as well as its quality and repeatability, are unparalleled. These robots can be reprogrammed and interchanged to provide a variety of uses.

### **CHAPTER 2: LITERATURE REVIEW**

A comprehensive literature review has been done and some of the efficient possible technologies and algorithms based on literature review and experimentation are suggested in the paper for the development of a Voice Controlled Robotic Vehicle.

### **CHAPTER 3: OBJECTIVE**

The Voice Controlled Robotic Vehicle project aims to create a robot that can be controlled through voice commands received via an Android application. The robot is designed to move in various directions, perform specific tasks, and communicate back to the user via the application.

### **CHAPTER 4: METHODOLOGIES**

To achieve a fully working voice controlled robotic vehicle some of the major methods are used, such as IoT(Internet of Thing) and Arduino. We are also using some sensors and motors for better functionality .

## **CHAPTER 5: EXPERIMENTAL SETUP**

The experimental setup for a voice controlled robotic vehicle using Internet of Things (IoT) would typically involve the following components:

Micro-controller, motor driver, sensors, motors, power source, android application etc.

## **CHAPTER 6: CONCLUSION AND FUTURE SCOPE**

Our robot can comprehend and respond to natural-sounding control commands. Simply put, in this system, an android application recognizes human speech and converts it to text, which is then processed and used to control robotic movements. It shows how control mechanisms can be acquired without the use of any other control mechanisms such as buttons or joysticks. The devices can be fully automated by improving speech reception and inducing additional instructions. This robot, with a few additions and alterations, could be used in the army to detect and dispose of hidden land mines. In the future, we can connect sensors to this robot to track certain parameters and increase efficiency by utilizing the Internet of Things(IOT).

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