

# VOICE-CONTROLLED CAR USING ARDUINO

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**Abstract:** Voice-activated A robotic vehicle (VCRV) is a sophisticated robotic vehicle that can be controlled by user (or client) commands. Our project's goal is to create a Voice control automation automotive mistreatment Arduino. An Arduino microcontroller, motor drivers, and a Bluetooth module are used in the operation. Arduino is an open-source hardware platform (single-board microcontrollers and kits) for creating digital devices. The plan is to first design the hardware of the automated car and then code the full operation using our existing programming knowledge. The code is then emulated on a software package (IDE) before being interfaced with hardware. A Bluetooth gadget is used to coordinate the management unit with the Bluetooth gizmo.

**Keywords:** Arduino, Bluetooth module, Motor driver, DC motor, Battery.

## I. INTRODUCTION

Because we live in an artificial intelligence-driven society where robots execute numerous activities, the voice-controlled automobile was invented to make human labour simpler. The vehicle is driven by the human voice. The fundamental idea behind the project is to operate the car via voice commands. The HC-05 module is used to send commands via the mobile application. Another HC-05 module on the robotic vehicle will receive the signals and operate in accordance with the order. The orders were sent to the mobile app from the Transmitter's side. The Bluetooth Module on the robot side is linked to the Bluetooth application on the mobile device. The voice will be recognised by the smartphone application.

## II. LITERATURE SURVEY

[1]. M Saravanan developed "Arduino Based Voice Controlled Robot Vehicle" published by the International Journal of Engineering Applied Sciences and Technology (October 2020) The main goal of this device is to create a robot vehicle that can be powered by a person's voice order. The abovementioned device is a prototype of our design. The concept is to build a robot that will be controlled by voice commands. A cell phone is used to operate the robot; several articles demonstrate the contact between a robot and a smartphone. The aim of a voice-controlled robotic vehicle (VCRV) is for it to listen to and respond to the user's commands.

[2]. Mrumal K Pathak, Javed Khan, Aarushi Koul, Reshma Kalane Raunak Varshney developed Robot management vogue exploitation humanoid Smartphone, published by the International Journal of Engineering Applied Sciences and Technology. The motivation behind this paper is to furnish very good machine humanoid stages with easier mechanism instrumentation vogue. This paper depicts suggests that thanks to the management of a mechanism utilizing transferable through Bluetooth communication, some highlights regarding Bluetooth innovation, segments of the versatility and mechanism. It presents an associate audit of mechanisms unnatural by smartphones by suggesting that moving the automaton upward, reverse, left and right side by the humanoid application, as an example, Arduino, Bluetooth.

[3]. N Ayush Ubale, Hardik Jethava, Poli Guha Neogi, Pranavya .M U developed Voice controlled vehicle using an MQTT(Message Queuing Telemetry Transport)server, published by the International Journal of engineering applied science and Technology. The car is operated by voice in this project of voice control. A mobile robot that can be managed by voice commands is known as a robot vehicle. The speech recognition program on an Android phone will recognize voice commands such as 'Forward,' 'Stop,' 'Left,' 'Right,' and 'Back,' among others.

The operating principle of the robotic car is based on information sent by phone to the robot. The results demonstrate that by using only one's voice as a method of control, a user can learn to influence real-world objects reliably. The proposed findings show that voice-controlled robotics would be effective in the future. This device could be used for a wide range

of tasks. In the future, systems such as washing machines, microwave ovens, and other home appliances will primarily be voice controlled. In this situation, the study would be able to effectively meet the current need.

[4]. R. Rajalakshmi, Y. Sushma, and T. Sowmya developed Voice Controlling Robotic Vehicle with a Bluetooth Module, Conclusion of this paper was they were going to develop a technology that is useful for modern and developing society. We can reduce the maximum number of accidents and also have pleasant driving. This robotic vehicle works on the principle of Arduino programming and Speech Recognition technology. The vehicle can be operated by using some simple voice commands.

[5]. Naveen Kumar<sup>1</sup>, M. NaveenKumar<sup>2</sup>, V. Nisha<sup>3</sup>, K. Shenbagadevi developed VOICE CONTROLLED ROBOT CAR USING ARDUINO was published by the International Journal of research publication and Reviews. The planned framework of our project shows that but a mechanism unit of measurement generally management utilizing Bluetooth. The voice dominant orders unit of measurement is effectively transmitted through Bluetooth innovation then like and in addition, the desired activities effectively happen. This task lessens human endeavors at spots or circumstances where human intercessions unit of measurement is laborious.

### III. OBJECTIVES

The primary goal is to allow a voice-controlled car to navigate to a specific location. Furthermore, the ultimate aim is to monitor the robot via voice commands. It is now possible to have human-robot interaction. We can monitor the robotic vehicle with the help of a smartphone and a human voice. The project aims to use voice commands to operate a robotic vehicle.

### IV. WORKING

The Arduino Wireless Voice Controlled Robot consists of a transmitter and a receiver section.

The transmitter end consists of Smartphone Bluetooth and the Android app installed on it.

Similarly, the Receiver section has an Arduino board as a processor, HC-05 Bluetooth Module as a wireless communication module, DC Motors, and L298D for driving motors.

Voice Commands are processed by phone, and speech-to-text conversion is done within the app using Google's speech-recognition technology.

The text is then sent to the receiver side via Bluetooth.

Text received via Bluetooth is forwarded to the Arduino Uno board using UART serial communication protocol. Arduino code checks the text received. Whenever the text is a matching string, the L298D driver controls the movements of the DC Motors i.e., Either forward / backward /Turning Right / Turning Left or Stop, and makes the car work accordingly.

The IR sensor which is connected at the front of the car has an IR emitter that emits the IR light of wavelength 780nm and frequency between 300GHz to 400THz. When an obstacle appears on the line of IR light at a distance of 2-40cm, the light is reflected by the obstacle which is sensed by the IR receiver and sends the signal to the motor driver and makes the car stop.

### V. COMPONENTS

#### 1. DRIVING MOTOR AND WHEELS.



A DC motor is a class of rotary electrical machines that converts direct current into mechanical energy. A wheel is a circular block of durable and hard material which is placed in an axle about which the wheel rotates when a moment is applied by torque or gravity, thereby making it one of the simple machines.

## 2. CHASSIS.



The chassis is the foundation structure of any car that supports it from under. The purpose of the chassis is to bear the weight of the car in its idle and dynamic states.

## 3. ARDUINO UNO BOARD.



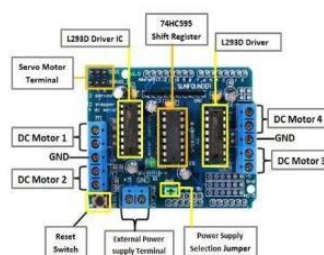
Arduino UNO is an open-source microcontroller board that can be integrated into a variety of electronic projects. The board has 6 Analog pins, and 14 digital pins programmable with the Arduino IDE software tool. It can be powered by an external 5-volt battery.

## 5.HC-05 BLUETOOTH MODULE.



Bluetooth module is intended for wireless communication. This module works with the supply of 5v supply. Its ranges up to <100m which depends upon transmitter and receiver, atmosphere, geographic and urban conditions. It uses serial communication to talk to devices. It communicates with a microcontroller using a port(USART).

## 6. L298D MOTOR DRIVER



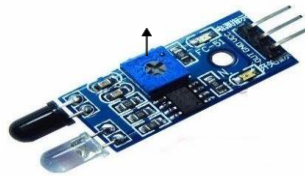
It is preferred as a motor-driving IC which switches the direction of the current which means a motor with a voltage range of 5V-35V.

## 7. Arduino IDE.



The Arduino Integrated Development Environment (IDE) is a bridge system for Windows, macOS, and Linux published in C and C++ functions. This is used to write and upload computer code to Embedded system boards.

## 8. IR SENSOR



IR sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. It emits IR light of wavelength 780nm with a frequency between 300GHz to 400 THz.

It senses the obstacle at a distance of 2 to 40 cm when IR light encounters the obstacle and makes the obstacle led to glowing.

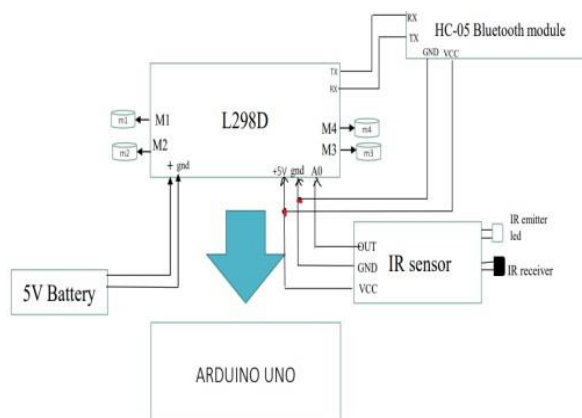
The minimum size of the obstacle that the system can detect is 5 cm\*5 cm.

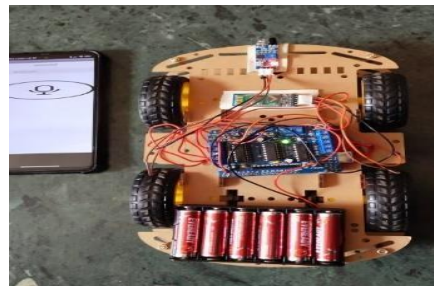
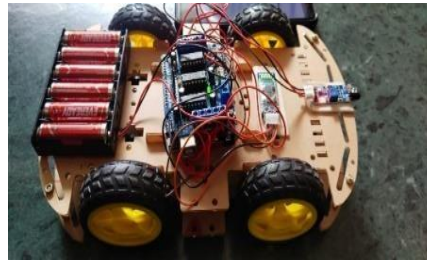
## 9. BATTERY



The 5v battery is used for the power supply for the system.

## VI. CIRCUIT DIAGRAM



**FINAL IMPLEMENTATION OF THE MODEL****VII. RESULTS**

Through the Design and implementation of our proposed system, we can achieve the following results:

The robot is controlled through voice commands given by the user who is operating the project. These voice command needs to be given through an Android app that is installed on the user's Android mobile. Speech recognition is done within the Android app and then a respective command is sent to the voice-controlled robot vehicle. Arduino fitted on the vehicle decodes these commands and gives an appropriate command to the motors connected to the vehicle.

**VIII. CONCLUSION**

We are going to develop a technology which is useful for the modern and developing society. We can have pleasant driving and can reduce the accident that occurs. This robotic vehicle works on the principle of Arduino programming and Speech Recognition technology. The vehicle can be operated by using some simple voice commands. This task lessens human endeavor at spots or circumstances where human intercessions unit of measurement is laborious.

**IX. FUTURE ENHANCEMENT**

- Controlling the speed of the vehicle can be done.
- Installing solar panels instead of using batteries, saves energy.
- It can also be developed for deaf and dumb people using hand gestures.
- Ultrasonic sensors can be used so that they
- can sense the obstacle in all directions.

**REFERENCES**

- [1] M Saravanan developed "Arduino Based Voice Controlled Robot Vehicle" (October 2020). International Journal of Engineering Applied Sciences and Technology, 2021 Vol. 6, Issue 4, ISSN No. 2455-2143, Pages 160-170.
- [2] Mrumal.K.Pathak wrote, "Robot Control Design Using Android Smartphone" (February 2015). International Journal of Engineering Applied Sciences and Technology, 2021 Vol. 6, Issue 4, ISSN No. 2455-2143, Pages 160-170.
- [3] Shubh Srivastava contributed "Voice-controlled robot car using Arduino" (May 2020). International Journal Of Engineering Applied Sciences and Technology, 2021 Vol. 6, Issue 4, ISSN No. 2455-2143, Pages 160-170.
- [4] Aditya Chaudhry implemented an "Arduino-based voice-controlled Robot" (June 2019). International Conference on Trends in Electronics and Informatics (ICOEI), ISBN: 978-1-7281-5518-0
- [5] Parichart Leechor wrote "Operation of a Radio-Controlled Car by Voice Commands" (March 2010). International Conference on Trends in Electronics and Informatics (ICOEI), ISBN: 978-1-7281-5518-0. on Trends in Electronics and Informatics (ICOEI), ISBN: 978-1-7281-5518-0.