

## **VOICE GUIDED EXPLORER OBSTACLE SENSE NAVIGATOR INTELLIROVER**

S.Devasundaram<sup>1</sup>  
Final year – EEE  
Mangayarkarasi college of Engineering  
Madurai  
[devasundaram247@gmail.com](mailto:devasundaram247@gmail.com)

S.Sadam Hussain<sup>2</sup>  
Final year - EEE  
Mangayarkarasi college of Engineering  
Madurai  
[sadamsyedmohammed@gmail.com](mailto:sadamsyedmohammed@gmail.com)

S.Gobinath<sup>3</sup>  
Final year – EEE  
Mangayarkarasi college of Engineering  
Madurai  
[gn97440@gmail.com](mailto:gn97440@gmail.com)

M.Aravind<sup>4</sup>  
Final year - EEE  
Mangayarkarasi college of Engineering  
Madurai  
[eraravind2003@gmail.com](mailto:eraravind2003@gmail.com)

Mr.B.Vadivel ,M.E(Ph.D) <sup>5</sup>  
Assistant Professor - EEE  
Mangayarkarasi college of Engineering  
Madurai  
[vadivelbalu.eee@gmail.com](mailto:vadivelbalu.eee@gmail.com)

### **ABSTRACT**

The major principle of the robotic vehicle is to accept the user voice command and perform the given user task and without the human presence specifically area can control the robot via user voice input. The robot can be operated through user voice input it requires android app to communicate via Bluetooth module. Subsequently, the robotic vehicle can sense the things with the assistance of Ultrasonic sensor module. For the hardware, customized Arduino will give the control over the motors that use to run the robotic vehicle. Ultrasonic sensors interact with the Arduino help in automatic braking of a vehicle on sudden obstacle detection. The obstacle avoidance robots are currently

employed in dangerous areas where the human cannot enter. It can easily recognize

the voice.

**Keywords:** Android, Arduino Uno, Bluetooth Module, Latitude, Longitude Etc.

## **INTRODUCTION**

The roots of foundation of robotics belong back in 1950s; more than six decades has passed since then, and robotic evolution has been running unparalleled. Today we can feel the presence of robots everywhere and in every field whether it is medical, military, education or governance and so on. Robotics has become a helping hand for humans, and they are making our life easier, better and faster. Robotics is a boon for human kind, because robotic machines are giving alternatives, which is providing a great support to physically impaired people. This

---

proposal focuses in the problems faced by

specially abled people who wish to drive their vehicle on their own but they cannot because of the natural cause. In this proposed project, the emphasis is on voice control of robot with automatic braking, speed slow down and avoidance of obstacles automatically or manually (through voice command). In this model, we will use an android app to pass on the voice commands to the Arduino through Bluetooth communication using Bluetooth module. Ultrasonic sensor will act as the obstacle detector, which will act as a mediator for Arduino microcontroller (or the CPU) and the proximal environment, and it would eventually lead to slowing down the vehicle or to fully break its motion.

## LITERATURE SURVEY

In 2003, Worldwide speculation in modern robots up 19%. In 2004, orders for robots were up another 18% to the highest level ever recorded. Overall development in the period 2004-2007 conjecture at a normal yearly pace of about 7%. More than 600,000 family unit robots being used several millions in the next few years. Various researches have been made by different researchers in developing this project. Be that as it may, they serve an alternate application and have various innovations actualized. Some of those papers are mentioned below stating their technology and application.

### Robot Control Design Using Android Smartphone.

This paper depicts how to control a robot through Bluetooth communication, a few highlights about Bluetooth innovation, It present an audit of robots constrained by smart phone by means of moving the robot upward, reverse, left and right side by the android

application,

## METHODOLOGY

Install any Bluetooth Application for Arduino. Pair HC-05 Bluetooth module with the mobile Default password is “1234” or “0000”. Click on the “MIC” icon and speak/instruct the robot .On speaking our speech gets recognized and converted into text. That text is transferred using Bluetooth .The Bluetooth Module receives the string, decodes it and compares it with the Instructions that are described in the program and moves the robot in direction given by the user using mobile application.

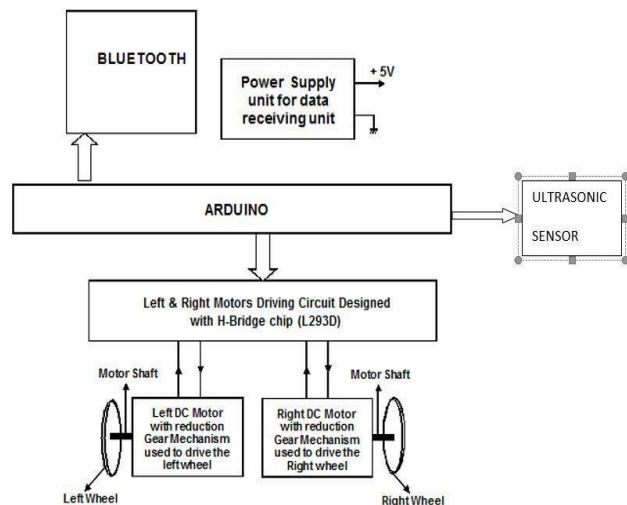


Fig 1 : Block diagram of voice control and obstacle avoiding robotic vehicle

## THE HARDWARE

### ARDUINO UNO

The Arduino Uno is an open-source microcontroller board dependent on the Microchip ATmega328P microcontroller and created by Arduino.cc. It is programmable with the Arduino IDE through a kind B

USB cable. It can be controlled by the USB link or by an outside 9-volt battery, however it acknowledges voltages between 7 and 20 volts. Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer.

access the control commands for the robot. In



**Fig 3 : Arduino Uno**

## **BLUETOOTH MODULE**

This project work consists of two main modules: the android mobile phone and the Arduino BT board (Bluetooth module). The android mobile phone consists of several Bluetooth apps which enables the user to

this project we are targeting Android platform since it has huge market and open source. A project can also be named as smart phone Android operated robot. Here is a simple control technique for your robot/robo car using Bluetooth module and microcontroller with your android Smartphone device. The controlling devices of the whole system are a Bluetooth module, DC motors that are interfaced to the microcontroller. The data received by the Bluetooth module from android smart phone is fed as input to the controller. The controller acts accordingly on the DC motor of the robot. The robot in the project can be made to move in all the four directions using the android phone. In achieving the task the controller is loaded with program written using Embedded 'C' or assembly Language

**Fig 4 : Bluetooth Module**



### **DC GEAR MOTOR**

In this project work Four DC motors are used to operate the robot. By giving the command signals from the mobile through the bluetooth app i.e., forward, backward, right and left directions, the robot will be moved.

DC motors are widely used, inexpensive, small and powerful for their size. They are most easy to control. One DC motor requires



only two signals for its operation. They are non-polarized, means you can reverse the voltage without any damage to motor. DC motors have +ve and -ve leads. Connecting them to a DC voltage source moves motor in one direction (clockwise) and by reversing the polarity, the DC motor will move in opposite direction (counter clockwise). The maximum speed of DC motor is specified in rpm (rotation per minute). It has two rpms: no load and loaded. The rpm is reduces when moving a load or decreases when load increases. Other specifications of DC motors are voltage and current ratings. Below table shows the specifications of the motor used in the project.

device in the circuit. L293d has an internal H-



**Fig 5 : Dc Gear Motor**

### **L293D MOTOR DRIVER**

L293d IC is known as a motor driver. It is a low voltage operating device like other ICs. The Other ICs could have the same functions like L293d but they cannot provide the high voltage to the motor. L293d provides the continuous bidirectional Direct Current to the Motor. The Polarity of current can change at any time without affecting the whole IC or any other

bridge installed for two motors. It may be small in size, but its power output capacity is higher than our expectation. It could control any DC motor speed and direction with a voltage range of 4.5 –

36 Volts. Its diodes also save the controlling device and IC from back EMF. To control the max 600mA amount of current an internal “Darlington transistor sink” installed in it, which could be used to control a large amount of current by providing a small amount of current. It has also internal “pseudo-Darlington source” which amplifies the input signal to control the high voltage DC motor without any interception.

**Fig 6 : L293d MOTOR DRIVER**

**Fig 7: 9V BATTERY**

#### **9V BATTERY:**

The main power source to drive the entire Vehicle including DC motors is designed to operate at Using a 9V lithium- ion battery to power an obstacle-avoiding vehicle is feasible, but it necessitates careful consideration of various factors. Primarily, one must ensure that all vehicle components, including motors, sensors, and control circuitry, can function within the battery's voltage range. Given the potential weight and size of lithium-ion batteries, their impact on the vehicle's maneuverability and performance should also be taken into account. Furthermore, implementing an appropriate charging system and adhering to safety protocols for lithium-ion batteries is essential to prevent accidents or damage. By addressing these considerations, utilizing a 9V lithium-ion battery can effectively power an obstacle- avoiding vehicle, providing the necessary energy for navigation and obstacle detection.

## ULTRASONIC SENSOR:

**Ultrasonic Sensors** also known as transceivers when they both send and receive work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor.



Fig 8: Ultrasonic Sensor

## SOFTWARE

### ARDUINO IDE SOFTWARE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called **sketches**. These sketches are written in the text editor and are saved with the file extension .ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information.

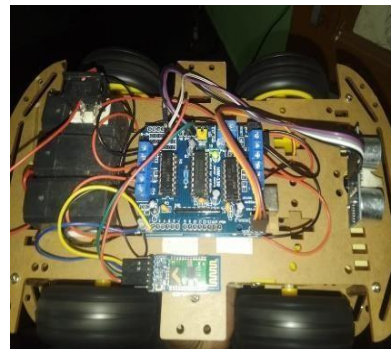
## RESULT AND DISCUSSION

### DEVICE:

The pictures below are to represent the result of this work.



Circuit off state



Circuit on state

### APPLICATION:





The pictures above are the screenshots

of android application which is developed using ANDROID STUDIO. The application is connected to the Arduino uno through the Bluetooth module and the voice commands are taken by the app and send them to Arduino uno through the Bluetooth module.

technology.

## **CONCLUSION**

The project work “Bluetooth controlled Robot” is designed and developed successfully, for the demonstration purpose prototype module is constructed and results are found to be satisfactory. Since it is a prototype module, a simple robot is constructed, which can be used for many applications. While designing and developing this proto type module, we have consulted few experts those who are having knowledge in robotics

## **ACKNOWLEDGEMENTS**

We would like to thank our guide Mr.V.Kanagasubramanian sir for his continuous support and guidance. Because of his guidance, we completed our project successfully. We are extremely grateful to Dr.N.M. VijayaKumar sir, Head of the Department of Electrical and Electronics Engineering, Mangayarkarasi College of Engineering for his support and encouragement.

## **REFERENCES**

- <sup>[1]</sup> Rahul A. Narhare, Mahesh G. Pawar, Amol M. Nagare, Lalu D. Jadhav, Devidas S. Thosar proposed a papertitled “Smart Voice Controlled Vehicle with Obstacle Detection Using IoT” that was published in the year 2021 by International journal of innovative research in

<sup>[2]</sup> Muruganantham ,S Dhivya, S Nandhini, Narmatha, K Ramya proposed a paper titled “An Obstacle Avoiding Robot Vehicle” that was published in the year 2021 by International journal of research.

<sup>[3]</sup> Ananya Ananth ,Ashritha S C proposed a paper titled “Bluetooth Based Obstacle Avoiding Robot” that was published in the year 2021 by International Advanced Research Journal in Science, Engineering and Technology.

### **TEXT BOOKS:**

- [1] Electronic Circuit guide book –  
Sensors – By JOSEPH J.CARR
- [2] Digital and Analog  
Communication System By: K.  
sam Shanmugam
- [3] Linear Integrated Circuits – By: D.  
Roy Choudhury, Shail Jain
- [4] Digital Electronics. By  
JOSEPH J.CARR