

# Robotic Car for Avoidance and Detection of obstacles using IR Sensor

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**Abstract** - In this project, design was implemented using a mobile phone as a network bridge. In robotic car, real time obstacle detection and obstacle avoidance are significant issues. In this study, design and implementation of a robotic car have been presented with regards to hardware, software and communication environments with real time obstacle detection and obstacle avoidance. In our project the robot is move by remote, mobile as well as itself. But when our robot i.e. WALL-E is collecting all the data from sensors to move front and back. By collecting the data itself it can conclude its own path quickly to go at its destination. In our project we use the same component which higher company is used but in lower cost that will attracts the user or customers to use this project.

**Keyword** - Battery, DC motors, IR Sensors, tiers, IC, wires, mobile, buttons, resistors

## I. Introduction

In the last decade, with the development of technology, sensors used with electronic devices have been used in many areas to facilitate life. Sensors are devices that convert energy forms into electrical energy. The sensors serve as a bridge connecting the environment and various electronic devices. The environment can be any physical environment such as military areas, airports, factories, hospitals, shopping malls, and electronic devices can be smartphones, robots, tablets, smart clocks. These devices have a wide range of applications to control, protect, image and identification in the industrial process. Today, there are hundreds of types of sensors produced by the development of technology such as heat, pressure, obstacle recognizer, human detecting. Sensors were used for lighting purposes in the past, but now they are used to make life easier. Thanks to technology in the field of electronics, incredibly fast developments are experienced. In this respect, it is possible to develop a new invention or a new application in every day and make life easier. Today, robot systems are developed with the use of artificial intelligence algorithms. The robotics field is one of them. The most important part of the robot is the perception. Perceive of the environment will be important for a robot design. For instance, it is very important to identify explosives by a robot to detect a terrorist in the military field by using sensors. A robot has to perceive some variables around it, interpret it, and then decide to act accordingly.

## II. LITRATURE SURVEY

| Title of Project                                                                                              | Year | Details                                                                                                                                                | Drawbacks                                                                           |
|---------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Remote and Autonomous Controlled Robotic Car based on Arduino with Real Time Obstacle Detection and Avoidance | 2018 | In this project the robotic car is driven through Arduino connected with the IR sensors which sense the real time environment and avoid the obstacles. | It consumes more time to detect the obstacles.                                      |
| Line Following Autonomous Office Assistant Robot with PID Algorithm                                           | 2018 | In this project the robotic car is follow the path or line with help of PID algorithm and detect the obstacles using Ultra-sonic sensors.              | If the line is faint or unreadable the robot can't detect and stop the car to move. |
| Line Follower Robots Controlling, Working Principle and Applications                                          | 2017 | In this project the robotic car line follower concept is discussed and how it works to follow the path or line is described.                           | It only give the working and principle. Doesn't perform the project.                |

### III. METHODOLOGY

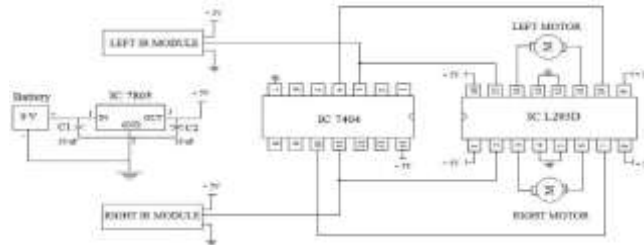


Fig: Design of Robotic car

When Robotic car is in moving state, it will detect the obstacles using the IR sensors which is installed on the front of the robotic car. Then this car avoid that obstacle and move on towards, if there is no way to move forward then it will go backward and find the way to go to the destination. This Robotic car also follow the Black line using the sensors. It will also be controlled by wireless communication using two mobile phones not necessary mobiles are smartphones only. One mobile is connect to Robotic car and other one is in hands of controller. And this Robotic car also be controlled by the wired remote also if any issues occurred in the network of mobile communication.

#### A. COMPONENTS :-

##### Hardware Requirements

- **IR Sensors**

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.



Fig: IR sensor

- **Micro-controller**

A microcontroller is a compact integrated circuit designed to govern a specific operation in an embedded system. A typical microcontroller includes a processor, memory and input/output (I/O) peripherals on a single chip.



Fig: Micro-controller

- **DC motors**

The DC motor is a machine that transforms electric energy into mechanical energy in form of rotation. Its movement is produced by the physical behaviour of electromagnetism. DC motors have inductors inside, which produce the magnetic field used to generate movement.



Fig: DC Motor

- **Wires**

A wire is a single, usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals.

- **IC**

An integrated circuit, or IC, is small chip that can function as an amplifier, oscillator, timer, microprocessor, or even computer memory.

- **Lithium Battery**

Lithium batteries are primary batteries that have metallic lithium as an anode.

- **Mobile device**

A mobile device is a computing device small enough to hold and operate in the hand.

#### IV. RESULT AND ANALYSIS

After all the connections are connected to micro-controller and other components to each other and checking all the connections. When the Robotic car is ready to work properly start the micro-controller by switching the ON the button. There are four modes are available i.e. avoidance and detection, line follower, wired remote controller, mobile as a controller.



Fig: Assembled Robotic Car

After choosing any of them such as we choose detection and avoidance of obstacles then the Robotic car will detect the obstacles like anything it can be human or stones or trees anything, it will avoid and move forward to its destination if there is no way to move forward then it will move backward and find the way to move on.



Fig: Detecting and avoiding function

Another option is Line follower; it follows the black line very accurately. If the line get faint then also it follow the line properly.

Another option is control through mobile connection, in this mode two mobiles needed to communicate with each other and control the Robotic car. In this we need to call the mobile which is connected to Robotic car, after receiving the we can control the Robotic car by the mobile wirelessly.

#### V. FUTURE WORK

- Connection through Wi-Fi or Bluetooth for short range radius.
- Using the video call, we can control the Robotic car.

#### VI. CONCLUSION

In this project we combine four technologies together for better convincing. By combining this four technologies in one device no need to take separate technologies for your work. This Robotic car is very easy to handle by any group of age users. It detect

and avoid the obstacles very easily by using IR sensor. It also follow the line if the line may get faint somewhere. This Robotic car is small that you can easily carry anywhere for work

## VII. REFERENCES

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