

# Title of the Project

# OBSTACLE AVOIDER ROBOT

*A Project report submitted in partial fulfilment  
of the requirements for the degree of B. Tech in Electrical Engineering*

*By*

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***CERTIFICATE***  
**To whom it may concern**

This is to certify that the project work entitled “ **Obstacle Avioder Robot**” is the bona fide work carried out by Ajay Biswas (Class Roll no. EE2014/017), Subham Mondal (Class Roll no. EE2014/002), Satyam Tiwari (Class Roll no. EE2014/049), Naresh Nandy (Class Roll no. EE2015/L09) , student’s of B.Tech in the Dept. of Electrical Engineering, RCC Institute of Information Technology (RCCIIT), Canal South Road, Beliaghata, Kolkata-700015, affiliated to Maulana Abul Kalam Azad University of Technology (MAKAUT), West Bengal, India, during the academic year 2017-18, in partial fulfillment of the requirements for the degree of Bachelor of Technology in Electrical Engineering and that this project has not submitted previously for the award of any other degree, diploma and fellowship.

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# TABLE OF CONTENTS

	Page No.
<b>1 .PREFACE</b>	
A) ABSTRACT.....	6
B) INTRODUCTION.....	7
C) SCOPE OF PROJECT.....	8
<b>2. INTRODUCTION TO EMBEDDED SYSTEM.....</b>	<b>9-11</b>
a. What is embedded systems	
b .Embedded system design cycle	
c .Characteristics of Embedded system	
<b>3. DESIGN OF PROJECT</b>	<b>12-16</b>
a. Block Diagram	
b. Circuit Diagram	
c. PCB Layout	
<b>4 . Hardware Requirements.....</b>	<b>17-41</b>
a) Microcontroller AT89s52	
i. Block diagram of AT89s52	
ii. Pin configuration of AT89s52	
iii. Pin description	
b) Liquid crystal display(LCD)	
i. Lcd Background	
ii. Lcd pin description	
c) Resisters	
i) unit	
ii) Theory of operation	
iii) Variable resistor	
d) Capacitors	
3 .Software requirements.....	41-47
a) Introduction to KEIL micro vision (IDE_)	
b) concept of compiler	
c) concept of cross compiler	
d ) KEIL C Cross compiler	
e) Building an Application in U Vision	
f) creating your own application in U vision	
g)Debugging an application in u Vision	
h)Starting u vision2 and creating a project	
i)Window Files	
j)Building project and creating a Hex File	
k) CPU Simulation	
l)Database selection	
m) Start debugging	
n) Disassembly Window	
o) Embedded C	
6. Coding.....	48
7. Compiler procedure .....	48-56



<b>8. APPLICATIONS</b>	<b>57</b>
<b>10. CONCLUSION.....</b>	<b>58</b>
<b>11. REFERANCES.....</b>	<b>59</b>

## **ABSTRACT**

In today's world ROBOTICS is a fast growing and interesting field. ROBOT has sufficient intelligence to cover the maximum area of provided space. It has an infrared sensor which are used to sense the obstacles coming in between the path of ROBOT. It will move in a particular direction and avoid the obstacle which is coming in its path. Autonomous Intelligent Robots are robots that can perform desired tasks in unstructured environments without continuous human guidance. The minimum number of gear motor allows the walking robot to minimize the power consumption while construct a program that can produce coordination of multi-degree of freedom for the movement of the robot. It is found that two gear motors are sufficient to produce the basic walking robot and one voltage regulators are needed to control the load where it is capable of supplying enough current to drive two gear motors for each wheel.



## INTRODUCTION

Now a day's Robotics is part of today's communication & communication is part of advancement of technology, so we decided to work on ROBOTICS field, and design something which will make human life today's aspect. There are different types of mobile robots which can be divided into several categories consists of wheeled robot, crawling robot and legged robot. This project deals with a wheeled autonomous ROBOT. It is the part of Automation; Robot has sufficient intelligence to cover the maximum area. This robot uses infrared sensor to detect the obstacle in between the path and then avoid them to complete its objective. The IR transmitter continuously generate an Infrared signal of 38KHz, when an obstacle comes in the path the infrared signal reflected back from the object and is received by the IR sensor TSOP1738 and then generate a positive high signal with the help of the receiver circuit that is there is an obstacle in the path. In such a way the robot is able to detect obstacles of provided space and able to avoid obstacles coming in between the path of ROBOT with the help microcontroller board and complete its journey.

The main motto of designing such type of Robot or the technology is that this technology can be used in today's very fast transportation to avoid the accident generally happen in congested or the Metro Politian Areas by applying emergency break. If we use this technology in the car or any vehicle, it will automatically sense the obstacles then it will take a side to the available free space. An obstacle may be a living things or any object. Autonomous Intelligent Robots are robots that can perform desired tasks in unstructured environments without continuous human guidance. Thus by using this technology in vehicles we make the drive safe.

## SCOPE OF THE PROJECT

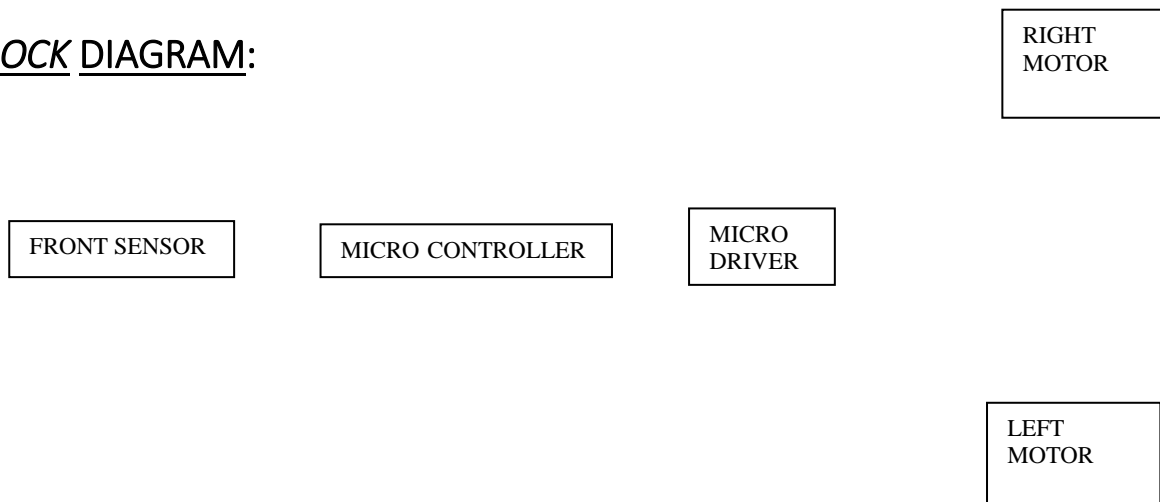
The project uses  $\mu\text{c}$  P89V51RD2 as the controlling element. It uses IR sensors and two IR transmitting circuitry. When the obstacle comes in path of robot IR beam is reflected from the obstacle then sensor gives zero voltage to  $\mu\text{c}$ . This zero voltage is detected then  $\mu\text{c}$  decides to avoid the obstacle by taking left or right turn. If the sensor gives +5v to  $\mu\text{c}$  that means there is no obstacle present in it path so it goes straight until any obstacle is detected.

The two IR transmitter circuit are fitted on front and left side of robot. The two IR sensor are placed near to transmitters' IR LEDs. The connections can be given from main circuit to sensors using simple twisted pair cables.

Two motors namely right motor and left motor are connected to driver IC(L293D).LC293D is interface with  $\mu\text{c}$ . Micro-controller sends logic 0 & logic 1 as per the programming to driver IC which moves forward or reverse direction.

DESIGN  
OF  
PROJECT

**BLOCK DIAGRAM:**



**DESCRIPTION:**

Basically circuit consist of following blocks:

- 1) Sensors
- 2) Microcontroller 89V51RD2
- 3) Driver
- 4) Motors

Let us take the overview of each block one by one.

1. **IR transmitter & receiver:**

The IR transmitter block mainly used to generate IR signal. It uses timer IC555 in astable multivibrator mode to generate square wave which have continuous pulse of 50% duty cycle of frequency 38 KHz .This transmitter is so arranged that the IR rays are focused on the sensor.

IR sensor (TSOP 1738) which gives normally 5v at output of it. After receiving infrared light at output of sensor we get 0v.

2. **Microcontroller:**

This is the most important block of the system. Microcontroller is the decision making logical device which has its own memory. I/O ports,CPU and clock circuit embedded on a single chip.

3. **Driver:**

L293Dis used as driver IC. Motors are connected to this IC, according to programme in µc it drives the left and right.



## 2. CIRCUIT DESCRIPTION:

### ELECTRICAL DESIGN:-

Component are properly mount on respective position .this include wiring and layout. The connection are given such that two IC's i.e. 89V51RD2 & L293D are interface.To L293D we connect two motors namely left & right motor.

We implement transmitter circuit separately & gives power supply independently. For power supply we use chargeable DC battery which having rating of 6v & 1.3A.output pin if sensor(TSOP 1738) is connected to micro-controller pin.

### MECHANICAL DESIGN:-

It include front panel which is given with ball caster wheel which is fixed .back panel is provided with circular wheel with dc motor of 12v and 100 rpm with suitable clip pin for fixing the tyre. All the assemble is fixed on base. All assembly mounted on single base.

## APPLICATION

Obstacle avoiding technique is very useful in real life, this technique can also use as a vision belt of blind people by changing the IR sensor by a kinetic sensor ,which is on type of microwave sensor whose sensing range is very high and the output of this sensor vary in according to the object position changes. This technique makes a blind people able to navigate the obstacle easily by placing three vibrato in left, right and the centre of a belt named as VISION BELT and makes a blind people able to walk anywhere

.On top of obstacle avoiding robot temperature/pressure sensors can be added to monitor the atmospheric conditions around. This is useful in places where the environment is not suitable for humans.

Same technology can be used in various application by modifying the microcontroller program for example :-

1. Line / Path finder Robot .
2. As automatic vacuum cleaner.
3. With proper programming we can use it as a weight lifter.
4. In Mines.

## **CONCLUSION**

From this study, a walking robot that achieved the stated objectives had been developed. This robot is able to produce the basic walking movements using two gear motors. We developed the robot with a very good intelligence which is easily capable to sense the obstacle and by processing the signal coming from the sensor it is perfectly avoiding the obstacle coming in between the path. Robot take the left or right or the forward movement in according to the sensing signal with the help of the two gear motor which makes the movement of the robot smooth. In future, the sensing range can be increased by increasing the sensor quality with the help of ultrasonic sensor or the IR signal spread all over the provide area.

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