
Line Following Robot without Using Microcontroller

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Abstract—

Line following robot without using microcontroller is a robot which follow the white strip on a black surface or black strip on a black surface. This is an autonomous robot which drive itself and here it has used the LED-LDR sensor instead of microcontroller.

Components:-

NAME OF COMP	QUANTITIES
a. LM358 & D.C. MOTOR	- 2
b. Variable 10K	- 2
c. Resistance& Wheel	- 4
d. Diode 4007 & LED	- 2
e. LDR	- 2
f. BC 547	- 2

I. INTRODUCTION

Nowadays, every robot functions with the help of the microcontroller, and hence the circuit is too complex to understand. For this reason, the Line follower robot is developed with a simple concept. This robot is a mobile automation robot which follows white line on a black surface or black line on a white surface. In this present scenario, often accidents on the roads occur due to careless driving of drivers. This line follower robot can reduce the chance of accidents to a great extent and it quite economical for transportation. Here two sensor pairs LED-LDR are

used. According to physics, if light falls on a white surface, it gets reflected but when it falls on black surface it will completely get

absorbed by the surface. The LDR (Light Dependent Resistance) acts as a sensor which senses the reflected light i.e. “transmitted light by LED”.

If the sensor is placed on a white surface, the D.C. motor is turned on and in black surface it will be turned off and robot will move accordingly.

II. BLOCK DIAGRAM:-

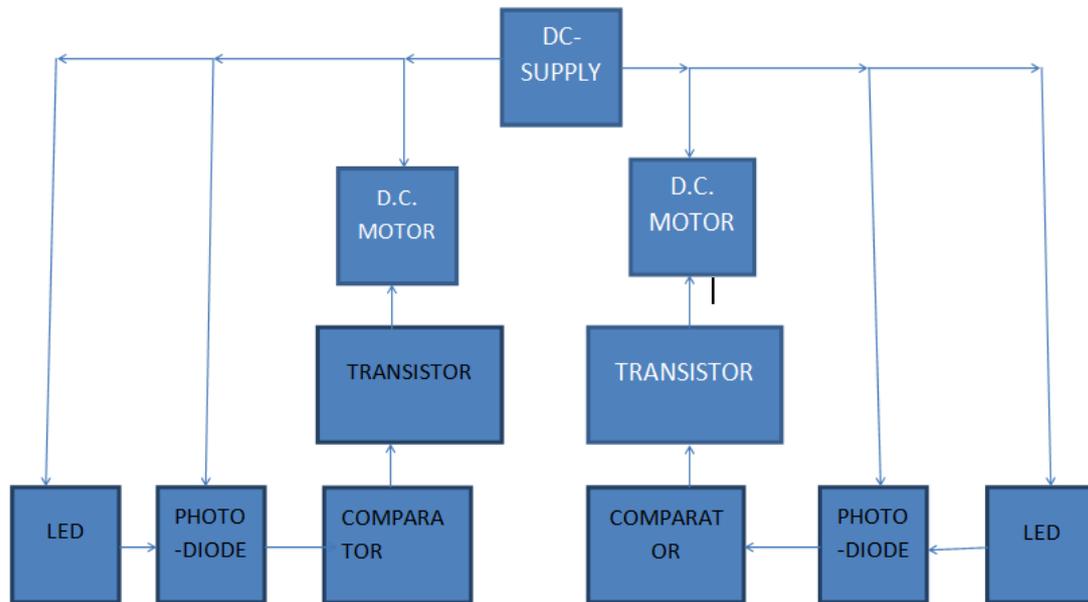


Fig:1 Basic Block Diagram Of Line Following Robot Without Using Microcontroller

III. CIRCUIT DIAGRAM:-

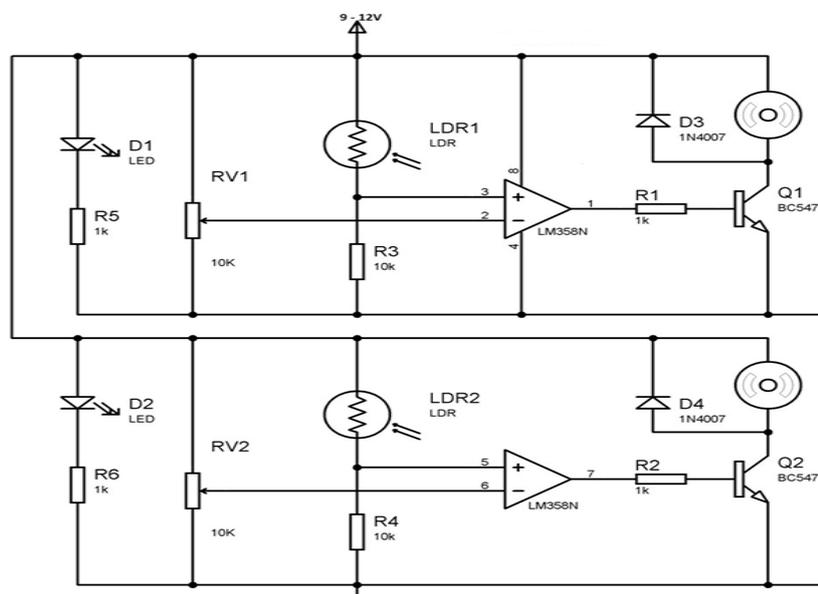


Fig: 2 Circuit Diagram of Line Following Robot Without Using Microcontroller

Circuit Description:-Here, LDR is connected to the non-inverting terminal of the comparator LM358N and variable resistor is connected to the inverting part of

comparator and in this connection when the LED-LDR sensor pair will be on the white surface then light will be reflected to the LDR and the resistance across the LDR

will be less and it will allow the current and voltage to pass through it and V_{max} (voltage across non-inverting terminal) > V_{min} (voltage across inverting terminal). So, the comparator will generate logic '1' that will turn on the circuit and this sensor pair will be on black surface, then $V_{max} < V_{min}$ and will generate logic '0' which will turn off the circuit.

This circuit basically consists of two parts:-

Comparator Circuit:- The 10k component is potentiometer which will be used to set the maximum range. This resistance, ideally should be near $(R(\text{light}) * R(\text{dark}))^{1/2}$; where, $R(\text{light})$ is the approximate resistance of LDR during light and $R(\text{dark})$ is the resistance of the same in dark.

LED-LDR sensor pair Circuit:-

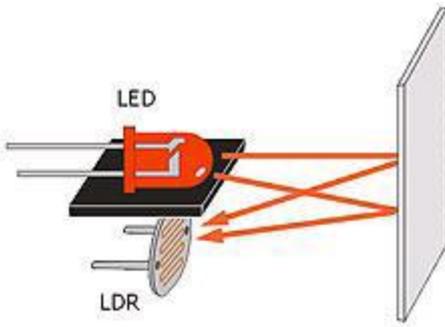


Fig: 3 Working Principle Of LED-LDR Sensorpair

when the sensor pair is on a white line,

- More led light reflected by the surface =>More light falls on LDR
- Lesser LDR resistance
- The voltage across LDR will be high Similarly, when the sensor pair is on a black line,
- The voltage across LDR will be low.

IV. CONCLUSION

In the modern age, implementation of something new which is more reliable & minimum in cost is needed. This type of robot can be used for defence purpose also. Using the idea of this project, robot which is used in various field for various purpose can be implemented.

V. REFERENCE

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