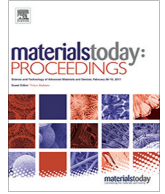




Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

Design and development of material behavior of line follower automated vehicle

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ARTICLE INFO

Article history:

Received 28 June 2020

Received in revised form 21 July 2020

Accepted 27 July 2020

Available online xxx

Keywords:

LED

Sensor

Robotics

D.C motor

Regulator

ABSTRACT

The model having two types of I.R LED (emitter), photoelectric sensor which provide the signal to motor via the transistor. The LED which emit the light it is wrapped up by sensors in the white surface. The Line follower robot is model which can identify and track the line drawn on the floor. Hence this model must be in sense the line with IR sensors. The processor is used to make a decision the correct signals. In this study, discuss the process design, development of material behavior, applications etc. The Line follower robot is a mobile based machine that can detect and follow the line drawn on the floor. This kind of model should sense the Infrared Ray sensor that fitted in the system.

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1. Introduction

A Robot is reprogrammable and multifunctional manipulator. It willing to explain about line follower robotic car in this session on robotics [1-4]. Our line follower robotic car is a position control one and it is meant for part handling / transfer and automated guided vehicle [5-8]. Due to the recent development in the industrial sectors, they should complete their work with in time and also maintain quality [9-12]. For this they are in require of automated system like robots to make their work in simple way and fast [13-18]. Basically the line follower is one of the self operating system which that permits a line drawn on the floor. The path can be a visible line on a white surface. The ne follower is a machine that can follow the any kind of path either curve or straight line. The path can be visible on a white surface or invisible says magnetic field. Generally for gripping purpose, the magnetic gripper is used. Basically the optical sensor which is are used to detecting the path. Fig 1-4Table 1.

1.1. Reason for automating

- Accuracy
- Hazardous

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<https://doi.org/10.1016/j.matpr.2020.07.650>

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- Repetitive task
- Efficiency
- Adaptability
- Flexibility and high speed.

1.2. Types of robot

- Stationary robot
- Mobile robot

2. Mobile robot

A robot that moves (on wheel or track with a motor) are a mobile robot.

- Ex: Robot buggy vehicle

Our Mobile robot is a light guided one.

3. Block diagram

3.1. Working

It consists of an infrared LED, and a photoelectric diode. When the infrared light from led is emitted, the photoelectric diode will absorbs the light (in white surface).The photodiode is in reverse

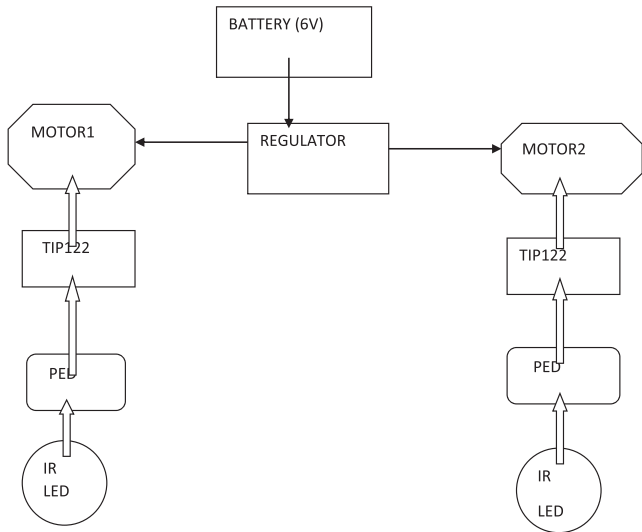


Fig. 1. Line Diagram.

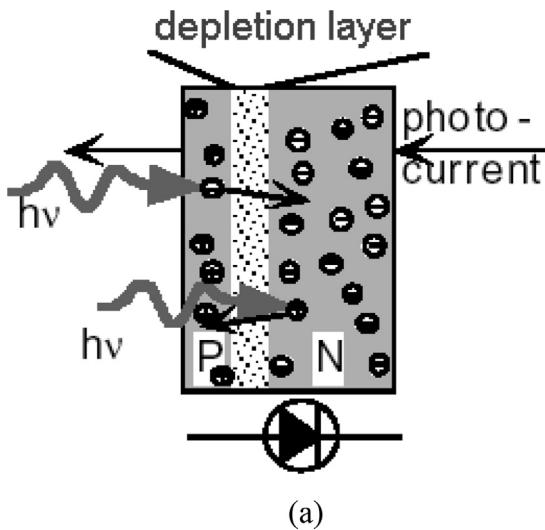


Fig. 2a. Arrangement of Depletion layer.

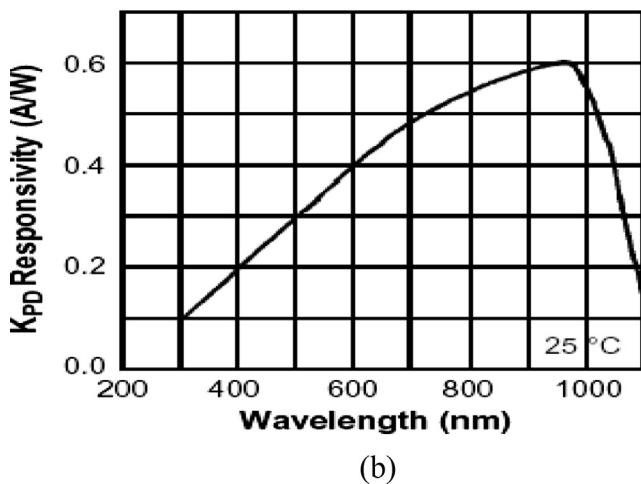


Fig. 2b. Wavelength vs K_{PD} Responsibility.

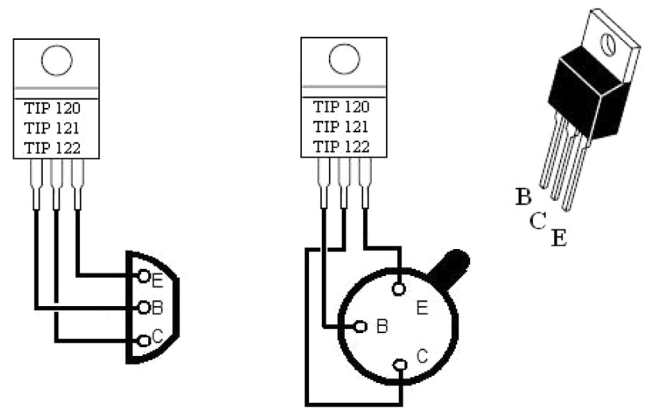


Fig. 3. Tip122 as an amplifier.

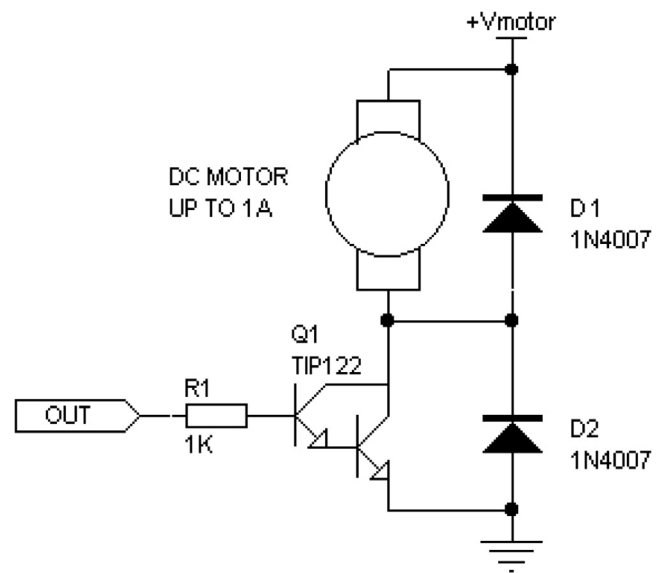


Fig. 4. Arrangement for Tip122 Transistor.

Table 1
List of Components.

S. No	Components	Specification	Quantity
1	D.C motor	150 rpm,6V,1A	2
2	Transistor	TIP122	2
3	Regulator	L7805	1
4	IR LED	1.6 V, 100 mA	2
5	Photoelectric diode	1 V	2
6	Resistor	10kohm, 470 O, 330 O.	2 each
7	Capacitor	4 micro farad	1
8	Circuit board	-	1
9	Wheel	Back, Front	1 each
10	Trace marker	Insulation tape(black)	1
11	Battery	1.5 V	4

bias condition, so it need amplifier. Hence here we used Tip122 transistor and capacitor [19-22]. The current (low amps) is sent to the capacitor, it discharge high current and is again sent to the transistor. Thus it sent signal to the motor.

If it is in curved path one side of the led falls on dark path, thus the photodiode doesn't absorb the light thus the motor doesn't get the signal. But other one runs, until it complete it's turning in the curved path. The Fig 2a shows Arrangement of Depletion layer and Fig 2b shows Wavelength vs K_{PD} Responsibility.

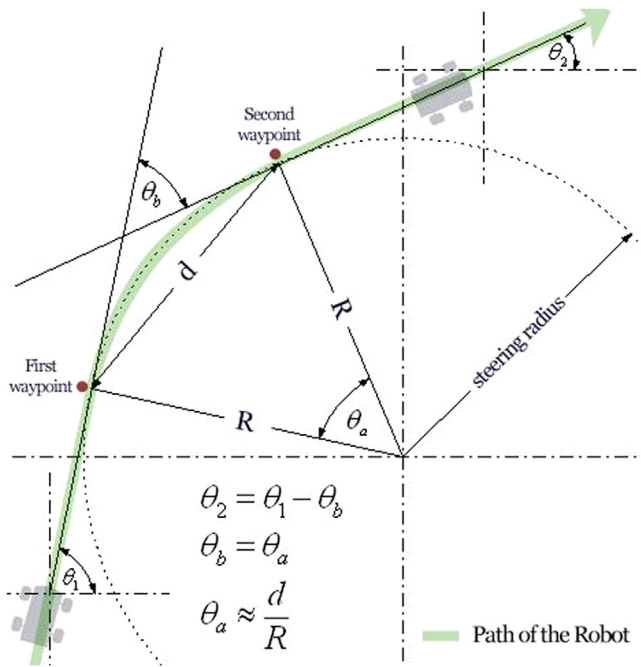


Fig. 5. Path of Robotic Car.

3.2. Battery

The battery is 6 V- 1A. This is the main source of power supply and supply power to all components through regulator.

3.3. Motor

The motor used here is a D.C motor (5 V, 1A). It gets power supply from the battery through regulator.

Since photoelectric diode gives output in few micro amps so it is not enough to give signal to the motor. Hence we are using transistor (Tip122) as an amplifier and it strengthens the signal and it is transferred to the motor hence motor operate. Thus the main function of transistor is to amplify the signal. The typical circuit for tip122 transistor is shown in above figure.

4. Path of robotic car

Fig. 5 shows the Path of Robotic Car.

4.1. Application

- It is driverless car and it is most applicable in industrial application.
- Especially carrying heavy parts like cope and drag without laying any track using long iron bars
- Increase rate of production.
- Doing repetitive jobs with high quality and accuracy.
- It is most widely used in hazardous area.

5. Conclusion

We had done this line follower robotic car as a project and this car possesses more advantages in industrial field. Thus line follower robotic car assembly made successfully and tested for working for its control. Nowadays the industries are using robot vehicle with iron bars laid tracks. But according to our project view we

can replace the track (using iron bars) by desired path (black) and thus we avoid material waste. This kind of system is enough capable and follow any kind of curve path also. It has light weight and more reliable speed. Hence can use for high speed motors and high sensitivity applications.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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