Line Following Robot Using Arduino

Article · December 2019

CITATIONS	READS
0	2,319

2 authors, including:

Md Takiul Hasan Sakib
North South University
1 PUBLICATION   **0** CITATIONS

Some of the authors of this publication are also working on these related projects:

Project   Fake news detection On social media View project

Line Following Robot Using Arduino

Md Takiul Hasan Sakib

takiul.hasan@northsouth.edu

Motivation :

We know that Ant can follow back their road though they can't see anything. On the way back to the street, the line is always a way back to the house to eat or avoid accidents and traffic. A robot that runs on line also. Which is a perfect or near the artificial nature. However, the goal of the robot in order to solve a problem or need is to create machines on hand, looking around again. There is some region will benefit from this project. Automatically Industrial equipment and engineering Carrier. The experience and the use of a small family equipment's. And other applications, the museum explores the way for a second wave of the processing enterprises as tour guide.

Goal :

  Line Following robot is automated small robot which works based on light reflection and absorption. It follows a line which can be linier or curve. It can take its own decision which line should be followed and where it should go. The small line following robot detect its position through sensor and send it to Arduino for getting instruction from the Arduino. It's an embedded system which is works based on hardware and software.

Introduction:

Line following robot is follows behavior of light. Two types of light used here one is black and white. White light reflects and black light absorbed the light. We used two sensors for making line follower robot. Which is called IR sensors. One is IR Transmitter and IR receiver is commonly known as IR Rx and IR Tx. In the figure-3 we can see IR tx incidence ray is a transmitter goes to white surface and from the surface reflected ray goes to IR Tx which is worked as receiver but when black surface gets IR light it absorbs. So it can not reflect. [1]

Methodology:

After reading book, journal, magazine and papers this project is based on well-defined manner. Project logic is mainly based on robot intelligence. Used a software "Arduino 1.5" for burning the software to hardware. Accuracy of the program is also tested even the hardwires also tested. After successful simulation it is implemented in hardware. Then programming, hardware and sensors part is completed. Finally, after omitting some errors it tested. [3]

Limitation:

Robot is made with compatibility hardware and software, if hardware changed it won't work.

Path of the line should be plane and obstacle free.

It can't be implemented in non-electric device.

Features:

Two kinds of features are included, one is hardware and one is software. It works together. Here are the features

• Arduino Uno.

• IR sensors

• The LM324 quad comparator IC.

•9 volts' battery

- motor shield IC (L293D)

- Two motors

- Connectors and Board

- Two IR-LED

For software part:

· Arduino software

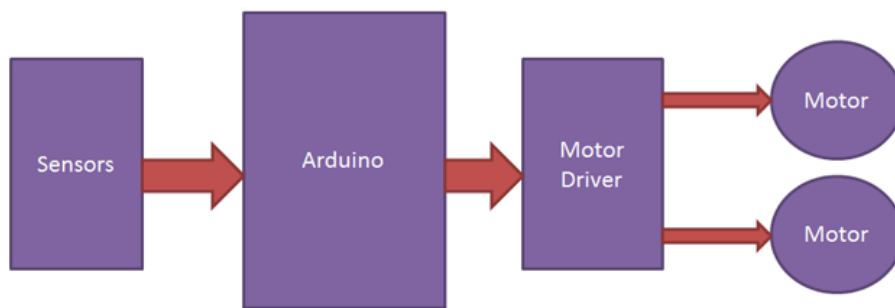Overall design lookup of the line following robot:

Fig1:Block diagram of the robot
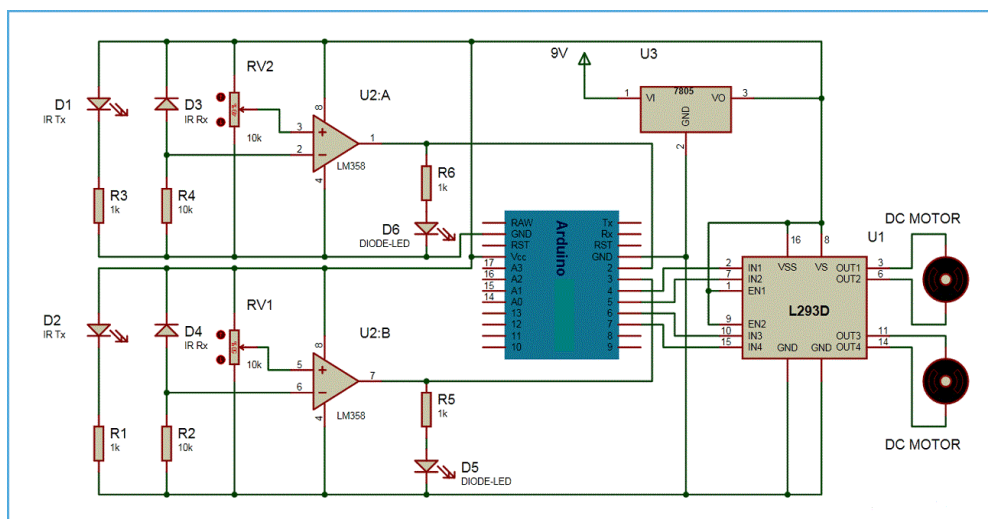
Here is the circuit diagram of the Arduino design

Fig2: circuit diagram of the design

Functions:

There are three types of functions of the robot which are sensor section, control section and driver section.

Sensor Section:

It controls IR sensor, from the line when sensor gets analog signal of the black and white line or light it help to detect it. Sensor name LM358 which generates signal to Arduino. But Arduino itself can't understand the sensor request so it's need an Analog to digital Converter which is known as ADC. [2]
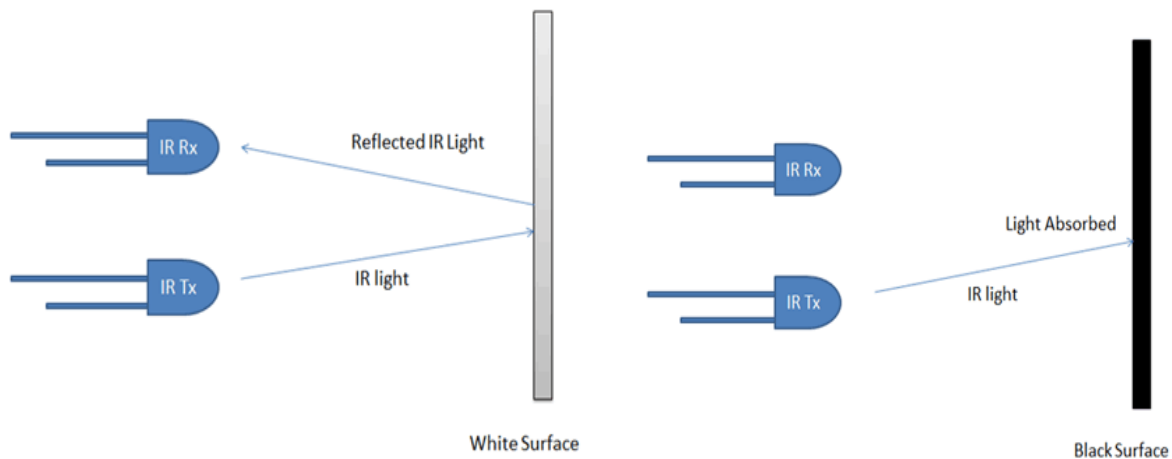

Fig-3: IR sensor of black and white line

Control Motor :

Arduino Uno is worked as control section. It controls whole line follower robot. It works like a brain of the robot.

Driver section :

DC Motor : Motor mechanical energy or motion energy, which converts various types of structure. The driving force behind the construction of a robot, the robot usually plays an important role in the process. In general, the motor current and the influence of the conductor and the permanent magnetic field. It is always a conductor current with the magnetic field, typically, will respond with the production of the magnetic field of the permanent magnet motor rotate. There motors are three main types of output, the DC motor, servomotor and stepper motors, with the construction of a robot. [4]

Is very easy to control the motors. There is a DC motor for its operation of the two signals. he was able to change the direction of the negative polarity power supply. Voltage through the various motor may change.

Motor Driver :

Motor driver works as a medium of microcontroller and Dc motor, it sends signal to motor, based on its signal motor works. So we can call it as switching device.

Conclusion : To using line following robot we can make our life easier, We can add some features and make it more workable when its need to follow a human. That machine can be a good choice of human life for making their lifer easier

References:

1. https://www.researchgate.net/publication/327814718_PROJECT_REPORT_LINE_FOLLOWING_ROBOT

2. https://circuitdigest.com/microcontroller-projects/line-follower-robot-using-arduino

3. https://www.researchgate.net/publication/277205656_Development_and_Applications_of_Line_Following_Robot_Based_Health_Care_Management_System

4. https://prezi.com/9j6eahjnhpno/line-follower-robot/