



e-ISSN: 2278-8875

p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 11, Issue 12, December 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.18

☎ 9940 572 462

☑ 6381 907 438

✉ ijareeie@gmail.com

@ www.ijareeie.com



Review on Line following and Obstacle Avoiding Robot with Arduino

Ashok Dhanesh¹, Atish Nagre², Anurag Deshmukh³, Shubham Padale⁴, Swapnil Tathe⁵

Student, Dept. of Electrical Engineering At MGM's Polytechnic Sambhajinagar, India*^{1,2,3,4}

Professor, Dept. of Electrical Engineering At MGM's Polytechnic Sambhajinagar, India*⁵

ABSTRACT:The line traces the line of sight to the following robot a smooth surface embeds and follows the ground. The path line is predefined and visible as a black line on white surface area or vice versa. A line follower robot is designed, Developed and executed on white or black on white lines On black using IR sensor and ultrasonic for object detector. The Arduino coding is developed using C programming and Tested and verified. The proposed system can be implemented on In any professional, industrial, medical and educational field as well Laboratory.

KEYWORDS:Line follower, obstacle detection, IR sensor and Ultrasonic sensor.

I. INTRODUCTION

The robot below the line is self-operating intelligent A machine that follows a line drawn on a floor area and path A line may appear black on a white surface; or white Lines on a black surface. It is an autonomous robot which identify and track on the white black line Surface area or a white line in a black surface area. the line The following robot must be able to trace the specified line and Keep track of it and assign tasks. for performance Job, a given path line must be designed and followed Robots developed for special situations. developed system Composed of input, process and output parts. Read first Take the black/white or white/black route on the perceived floor and Input signal for transmission to microcontroller (Arduino UNO) in a process where it can be asked and decided. The microcontroller makes a decision based on the input it receives Change (if necessary) to make the direction or motion of The robot converts these results into any directions Sent at line follower speed. The system first sends or Rear adjust control signal for speed and direction of Line follower robot.

An ultrasonic sensor is required to design a line follower, which is a device that can measure the distance of an object Using sound waves. It measures the distance between object and line follower by sending sound waves to a Listening for specific frequencies and that sound wave Again it is important to understand that some items may not Detection by ultrasonic sensor. This can be applied to the military Purpose, delivery service, transport system, blind Support application. Finally, there are many annual lines Follower robot competitions or organized by universities Industry worldwide.

II. LITERATURE SURVAY

Two Wheels Balancing Robot with Line Following Capability NorManiha Abdul Ghani, FaradilaNaim, World Academy of Science, Engineering Technology International Journal of Mechanical and Mechatronics EngineerVol:5, No:7, 2011.

Development and Applications of Line Following Robot Based Health Care Management System by Deepak Punetha, Neeraj Kumar, Vartika Mehta, International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 2, Issue 8, August 2013.

III. PRINCIPLE FOLLOWING THE LINE

Here in this line follower robot we are using two IRs Sensor Module Left Sensor and Right Sensor. When the two leave And the right sensor senses white then the robot moves forward (Fig. 1.1). If the left sensor lands on the black line, the robot turns In the black line on the left side. (Figure 1.2). If the right sensor sense is black line, then the robot turns



right until both sensors are white. When the surface reaches the white surface, the robot starts moving forward. Next again (Fig. 1.3). If both sensors fall on the black line, Robot stops (Fig. 1.4).

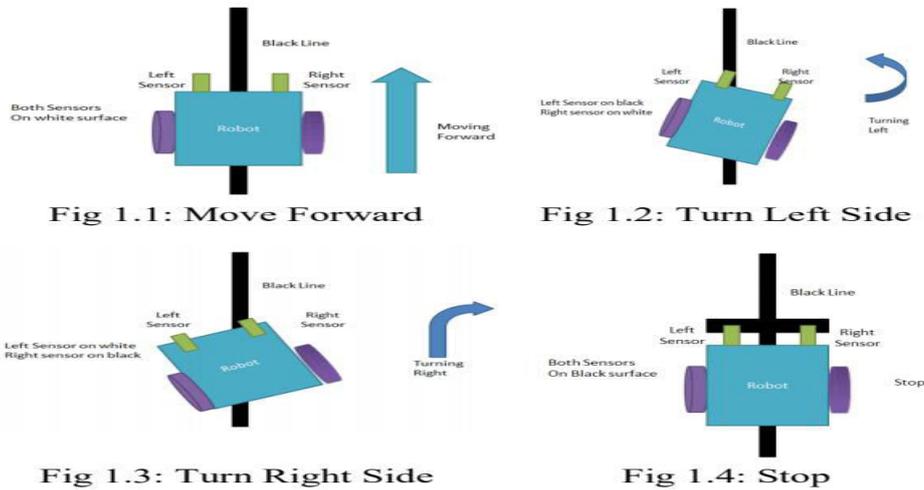


Fig 1: Principle of line follower

IV. PATHS OF LINE FOLLOWERS

A line follower robot follows a path drawn on the floor. The line will be predominantly black on a white surface. If it occurs any Line breaks on its way, the robot will move forward. If it is found a Cross line, the robot will stop. Lines and robots can move Change programming code easily. A few lines a robot can follow:

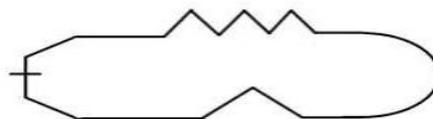


Fig 2: Sample path

The robot will follow a bad angle of 45° and cycle or badIt will stop when it finds the curved cross black line.

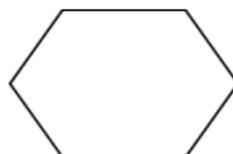


Fig. 3 :Polygon shaped path



On any type of polygon, it can follow the line and Maintain a certain speed.



Fig, 4 : Cycle and hard curve

The line may contain cycles and unwanted curves Following in a narrow space or moving from one room to another.

V. EXPERIMENTAL EQUIPMENT

The proposed robot is composed of several components and they are: Arduino Uno R3, Arduino IDE, Ultrasonic Sensor(HC-SR04),IR Sensor Array, motor driver (L298N), Li ion Battery,TT gear motors withwheels.

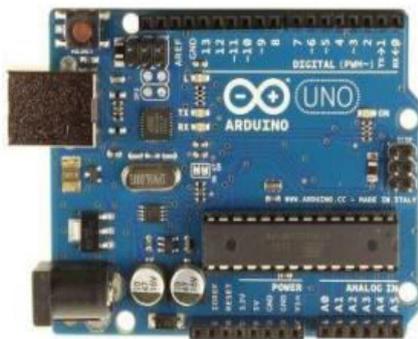


Fig. Arduino uno R3

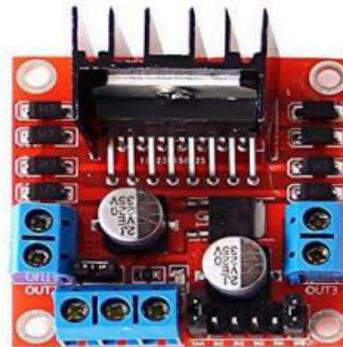


Fig. Motor driver module



Fig. Ultrasonic sensor



Fig. IR Sensor

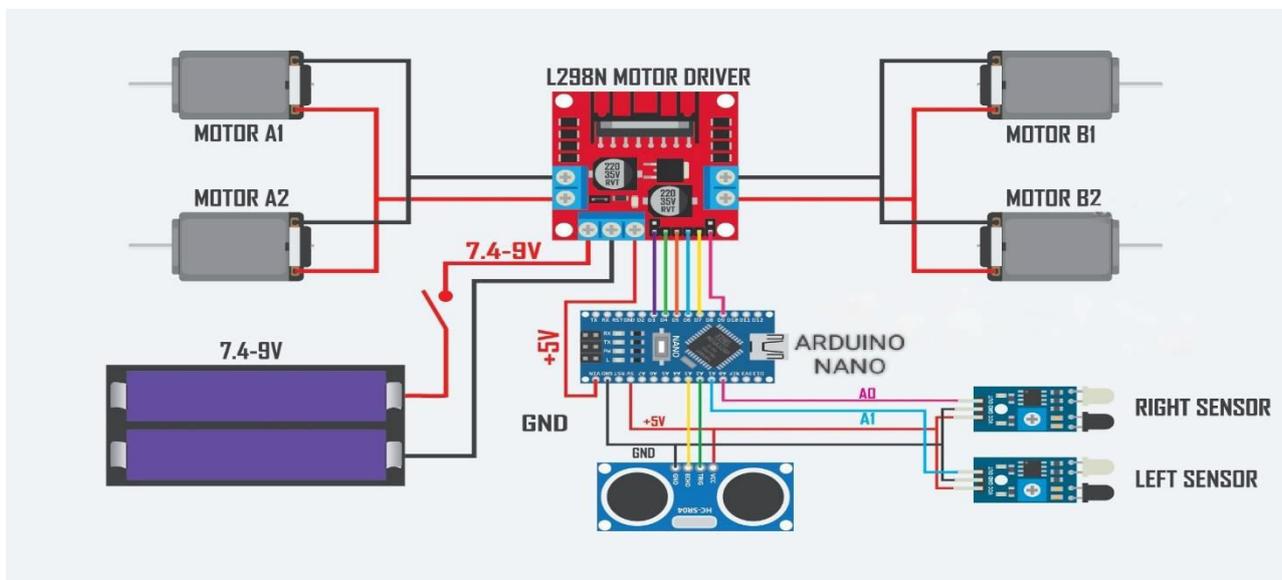


Fig. Li ion Battery



Fig. TT gear motor with wheels

VI. CIRCUIT DIAGRAM



VII. APPLICATION

There are some known applications designed line follower robots and they are presented below:

- (a) It can be used to deliver mail to the office building, industrial floor, medical ward and any robotics Lab for Education.
- (b) It can be any mass transit system either bus stations of any airport.
- (c) Line follower robots can be applied in military spy activities by moving children.

VIII. CONCLUSION

The robot is designed, developed and developed below the line implementation that does not require any remote controller, Bluetooth, Wi-Fi, GSM etc. It will work automatically with this follow the given line using Arduino microcontroller. come on The line follower robot is low cost but very effective for a variety of applications Purpose This approach can be applied in different areas Like office building, industrial floor, medical ward and others Robotics Lab for Education Purposes.



REFERENCES

- [1] K. R. Chowdhury, M. Di Felice, “Search: a routing protocol for mobile cognitive radio ad hoc networks,” *Computer Communication Journal*, vol. 32, no. 18, pp. 1983-1997, Dec.20
- [2] K. M. Passino, “Biomimicry of bacterial foraging for distributed optimization,” *IEEE Control Systems Magazine*, vol. 22, no. 3, pp. 52-67, 2002.
- [3] Q. Wang, H. Zheng, “Route and spectrum selection in dynamic spectrum networks,” in *Proc. IEEE CCNC 2006*, pp. 625-629, Feb. 2006.
- [4] R. Chen et al., “Toward Secure Distributed Spectrum Sensing in Cognitive Radio Networks,” *IEEE Commun. Mag.*, vol. 46, pp. 50–55, Apr. 2008.
- [5] H. Khalife, N. Malouch, S. Fdida, “Multihop cognitive radio networks: to route or not to route,” *IEEE Network*, vol. 23, no. 4, pp. 20-25, 2009.
- [6] Y.-C. Liang et al., “Sensing-Throughput Trade-off for Cognitive Radio Networks,” *IEEE Trans. Wireless Commun.*, vol. 7, pp. 1326–37, April 2008.
- [7] P. K. Visscher, “How Self-Organization Evolves,” *Nature*, vol. 421, pp. 799–800 Feb.2003.
- [8] K. M. Passino, “Biomimicry of bacterial foraging for distributed optimization,” *IEEE Control Systems Magazine*, vol. 22, no. 3, pp. 52-67, 2002.
- [9] Q. Wang, H. Zheng, “Route and spectrum selection in dynamic spectrum networks,” in *Proc. IEEE CCNC 2006*, pp. 625-629, Feb. 2006.
- [10] R. Chen et al., “Toward Secure Distributed Spectrum Sensing in Cognitive Radio Networks,” *IEEE Commun. Mag.*, vol. 46, pp. 50–55, Apr. 2008.
- [11] H. Khalife, N. Malouch, S. Fdida, “Multihop cognitive radio networks: to route or not to route,” *IEEE Network*, vol. 23, no. 4, pp. 20-25, 2009.
- [12] Y.-C. Liang et al., “Sensing-Throughput Trade-off for Cognitive Radio Networks,” *IEEE Trans. Wireless Commun.*, vol. 7, pp. 1326–37, April 2008.



INNO  SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.18



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 9940 572 462  6381 907 438  ijareeie@gmail.com



www.ijareeie.com

Scan to save the contact details