Line Follower Robot Using Artificial Intelligent

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Abstract- *Line follower senses black line by using sensor and then signal to Arduino. Then Arduino drives the motor according to sensors output. In this project two IR sensor modules namely left sensor and right sensor are sed. When both left and right sensor senses black line on white surface then the robot will move forward. Line follower robot that can follow a path. The path can be visible like a black line.*

Keywords- Introduction, proposed system, existing system, modules, advantage, conclusion, reference.

I. INTRODUCTION

Aline follower robot is basically a robot designed to follow a line or path already predetermined by the user. This line or path may be as simple as a physical black line on the floor or as complex path marking scheme. e.g.,embedded line, magnetic markers and laser guide marker. In order to detect these specific marker or line, various sensing schemes can employed.These scheme may vary from simple low cost line sensing circuit to expensive vision system. The choice of these schemes would be dependent upon the sensing accuracy and flexibility required. From the industrial point of viewline follower robot has been implemented in semi to fully autonomous planets. Basically line follower robot is a self-operating robot that detects and follows a line drawn on the floor .The path to be taken is indicated by a black line on white surface.

II. PROPOSED SYSTEM

Line follower robot detects the line or path using Arduino sensor. The robot determines the shortest path with artificial intelligence. The robot can do all the tasks it is set to do.

The factories can make a robot and get most of the work done by it.There is no need for a human operator; the robot can perform the same path on its own.

These types of robot movements are usually automatic. They can also be used for long distance.

III. DESIGN AND FABRICATION

Once the main configuration is chosen, the first thing to do be make a functional block diagram. Hardware, logic, motor control and many others thought come rushing in.
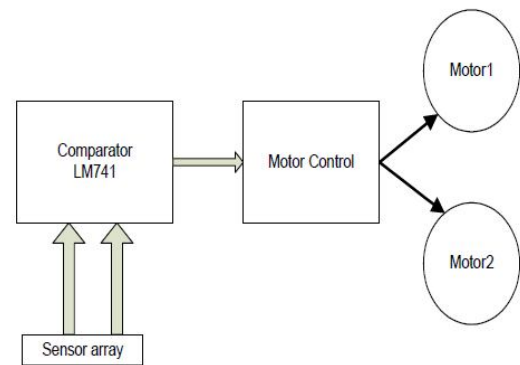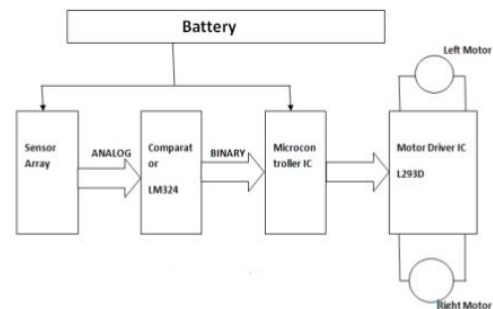

Fig1: block diagram

Fig2: system architecture

IV. EXISTING SYSTEM

A line follower robot is an electronic system that can detect and follow the line drawn on the floor. Generally the line is specified a predefined path visible like a black line on a white surface with a contrasted color.
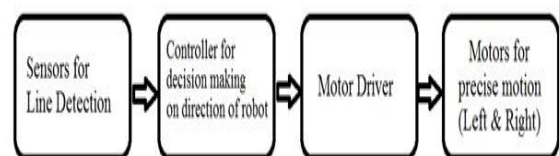

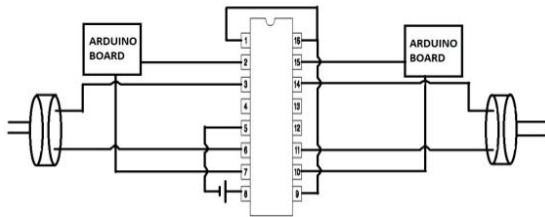Fig4: System architecture

1. ArduinoUNO:

Fig3: Arduino UNO

This is the brain of this robot in which the program is loaded to do the required functioning and is interfaced with the sensor and the motor drive to make the system work as required.
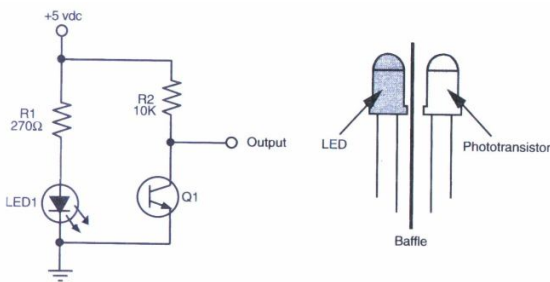
2. IRSensor:

Fig5:IRsensor block diagram

This senses whether there is platform in front of the robot or an edge is arrived and send theappropriate signal to the comparator.
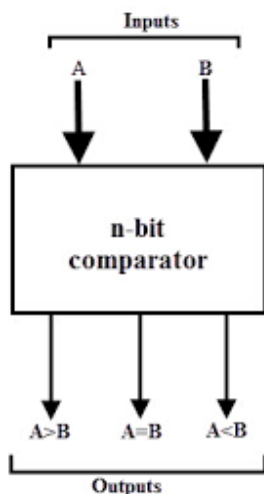
3. Comparator:

Fig6:comparator block diagram

This gets input from the sensor,compare it with predefined voltage and send logic 1 to microcontroller if there is detected a still platform and logic 0 if edge of platform is there.This line follower robot is easy method to navigate the black track line is to turnON and OFF the left or right DC motor.
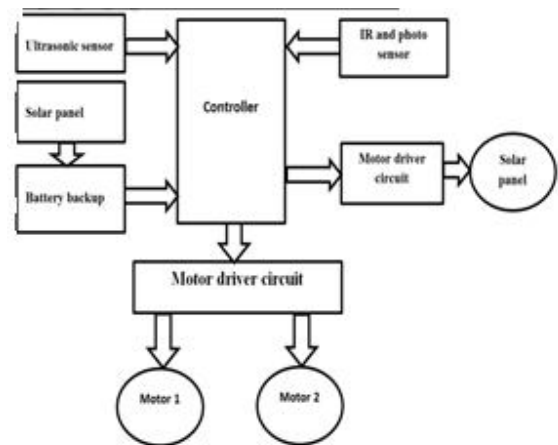
4. DCmotor:

Fig7:DC motor

This motor is controlled with DC voltages avd can move in forward and back ward direction according to the polarity of the voltage applied.

DC motor is a machine that transform electric energy into mechanical energy in form of rotation .Its movement is produced by physical behavior of electromagnetism. DC motor have inductor inside ,which produced the magnetic field used to generate movement .

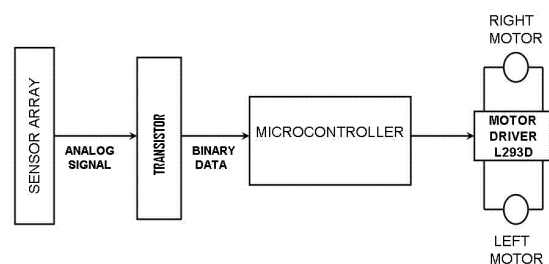5. Motor driver IC:

Fig8:motor driver IC

Motor driver IC which has two channels for driving two motors. L293D has two inbuild transistor darlington pair for current amplification and a separate power supply pin for giving external supply to motors.

6. Wheels:

In wheels are employed,two rear end and one at front end.rear wheels are attached with the motors and also control the steering of robot. front wheel is the loose steered wheel which move in the direction of the pressure applied to it.

The line follower robot follows certain path and the motion of the robot along this path is controlled by controlling the rotation of wheels,which are placed on the shafts of the two motors.

7. power adopter:

This is used to give appropriate DC power supply to microcontroller,driver IC sensors and the other passive components of the robot.

Line sensing:

The basis priciple of the line follower robot actually almost the same as the light follower robot,but instead of tracking the light the LFR sensor is used to track the line.Therfore by differentiating the line color and its surrounding (black on white surface)any light sensitive sensor could be used to navigate the robot to follow this track .
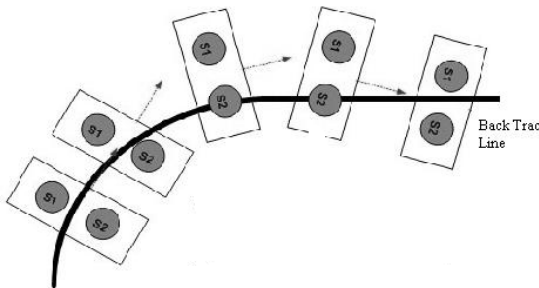

Fig9:line sensing flow

Sample path :

The line follower is a self operating robot that detect and follow a line that is drawn on the floor .The path consist of a black line on a white surface .The control system used must senses a line and maneuver the robot to stay on course ,while constantly correcting the wrong move using feedback mechanism ,thus forming a simple yet effective closed loop system .
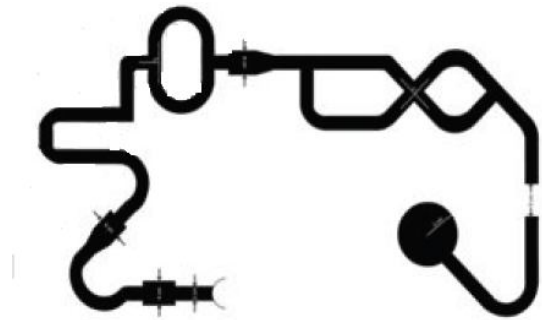

Fig10:sample path

V. CONCLUSION

We have successfully implemented the entire circuit on the PCB with obstacle detection feature.The level of sophistication is quite low and hence its working is user friendly.

This project we developed a robotic wheel chair with an in build program microcontroller to which sensors are connected. Ultrasonic sensing in a little for distance always monitor the position of wheel like as bend and front or back or right or left sensor.

In this project we have studied and implemented a line follower robot.

REFERENCES

[1] Bajestani,S.E.M., Vosoughinia, A., "Technical Report of Building a line Follower Robot "International conferrence on Electronics and Information Engineering (ICEIE 2010),vol 1,pp v1-1 v1-5,2010.

[2] Bong. D.M.K ,"Automatic Guided Vechile System" in Deprtment of Electrical Engineering,University Temega National ,Malaysia,P.41,2004.

[3] Colak,I.,Yildirim,D.,"Evolving a Line Following Robot to use in shopping centers for entertainment",Industrial Electronics,2009.IECON '09.35th Annual conference of IEEE,pp.3803 -5Nov 2009.

[4] Development and Applications of Line Following Robot Based Health care Manegement system Deepk Punetha, Neeraj Kumar, Vartika,Mehta,International journal of Advanced Research in Computer Engineering &Technnology(IJARCET),volume 2,Issue 8,August 2013 p2446-2450.

[5] Health Care System –Liverpool-ha.org.uk.Retrieved 2011-08-06.

[6] http:en.Wikipedia.org/Wiki/Health System.

[7] K.A.Unyeliglu,C.Hatipoglu,and U.Ozguner,"Designed and analysis of a line following robot controller

",IEEETrans.Control System Techno1,vol5,no.1,pp,127-134,1997(pubitemit 127770536).

[8] M.MehdiSamaatiyan ,mehran pakdaman"Design and implementation of line followers robot ".Mazandaran Institute of Technology,Iran ,2009,Second International Conference on Computer and Electrical Engineering .

[9] Priyank patil,"AVR Line Following robot ,"Department of Information Technology K.J.Somiya College of Engineering Mumbai ,India.