Line Follower Carrier Bot

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Abstract - Now a days lots of machines are proposed for reducing the human work. Humans need lot of time and work hence we are introducing Automatic Carrier Bot which will reduce the Human's efforts. As the proposed Automatic Carrier Bot is based on Internet of Things(IoT), we are making an wireless application to give the instruction to the carrier Bot for executing the task. The machine or robot that carries message automatically to the destination by following a particular path given by the sender. The message and destination are given from an application developed for the proposed bot. The proposed bot working on line following algorithm.Line following design to make the movement automatic, by following.This projects aims to implement the algorithm and carry message to the destination by avoiding the obstacles, to detect the obstacles an ultrasonic sensor is fixed. In addition an LED screen is added in order to display the notice and to take entries. It can be used institutional automated notice carrier,industrial notice carrier, small transport applications and other similar applications, etc.

Key Words:Arduino Uno, IoT, line follower, Obstacle Avoidance

1.INTRODUCTION

According to various reports and studies, the number and variety of robot applications in industry and our day to day life increasing. But many robots are specialized, being barrier to a limited number of operations. The Internet Of Things infrastructure allows connections between different entities (i.e. Human beings, wireless sensors, mobile robots, etc), using different but interop able communication protocols and makes a dynamic multimodal/ heterogenous network. The Internet of Things (**IOT**) provides an internet connectivity to the physical devices. Line follower is a machine that can detect the path. The path can be a black line over white surface. Sensing line with the help of IR sensor and keep robot on line by avoiding the obstacles. IOT is widely used in the areas of innovation. The aim of this project is to carry notice given by the admin, which is directly displace on the LED screen fit on the bot to the destination which is given by admin. This is basically designed for institutional application such as school, colleges, and universities for carrying notice on particular place in a campus. The bot consists of DC gear motors, motor driver, Infrared sensor, ultrasonic sensor, Arduino Uno, LED screen,12V battery, wheels. Motor driver is used to control the movement of DC motors when they want to turn left or right.

i. HARDWARE REQUIREMENTS

Arduino UNO is the main device we use in this proposed bot to connect all the other devices. Arduino UNO is an electronic micro controller board which is easy for software and hardware use. It takes input in the form of light of sensorsand turns outputs it into activating the motors.

H BRIDGE (Motor Driver) controls DC motor to take appropriate action. These circuits are often used in robotics and other applications to allow DC Motor to run forward and backward.

The Infrared Sensor consist of IR LED and IR Photodiode.IR LED emits light which strikes on the surface and gets reflected back to the photodiode. By this process IR Sensor detects a particular path or a black line. **Ultrasonic Sensor** sends sound waves and measures the distance to an object when it bounced back. For obstacle avoiding these

sensors are used. 12V **Battery** is used for supplying power.

ii. INSTALLATION OF BOT

The installation of proposed bot uses Arduino Uno to manage other devices viz.IR Sensors, Ultrasonic Sensor, Motor Driver, DC Motor. Arduino UNO controls each device as per program given thereto. Program is coded in Arduino UNO with the assistance of ARDUINO IDE software through which it gives instruction to every of its devices. Arduino UNO is connected with motor driver. The opposite devices like IR Sensor, Ultrasonic Sensor are connected with Arduino UNO. Two DC Motor are connected to the H Bridge (Motor Driver). Because the H Bridge get power supply through 12V Battery Arduino and other devices gets activated.

Literature Survey:

1. A line follower robot from design to implementation: Technical issues and problems, Mahdi Rezaei Ghahroudi

In its current form robot is enough capable. It can follow any curvee and cycle. We must build a robot that has light weight and high speed because points are awarded based upon the distance coveered and the speed of the overall robot. Therefore, we used two high speed motors and high sensitivity sensors circuit. The body weight and wheels radius have effect on speed, too. The weight of the designed robot is around 300 gram and it can be lighter .To get better maneuverer, we must build a robot that uses two mores and two wheels on the rear and a free wheel on the front the power supply is 12 V with regulator

2. Smart and Intelligent Line Follower Robot with Obstacle Detection M. Sri Venkata Sai Surya1 , K. Bhogeshwar Reddy2 , K. Pavan Kalyan3 , S. Senthil Murugan

The applications of the line follower are limited because it cannot be controlled. The only way to control the line follower is to change the path. Using WIFI module to control the line follower robot will not be helpful because more power will be consumed, so the battery will drain out quickly. Apart from these limitations smart and intelligent line follower robot can be used for long distance applications with a predefined path. This smart and intelligent robot has more benefits because it doesn't consume much power. This robotic system can provide an alternative to the existing.

3. Development and Applications of Line Following Robot Based Health Care Management System

The cost of health care majorly depends upon the expensive machinery, land and building and round the clock staff to maintain and use that machinery.In a country like India where the population is humongous and resources are scare. It became really difficult to set up such a capital extensive project at each and every location with availability of skilled staff. So what this system provides is an alternate to the existing system by replacing skilled labor with robotic machinery, which in turn can handle more patients in less time with better accuracy and a lower per capita cost.

4.Line follower and obstacle avoidance bot usingarduino 1aamir attar, 2aadil ansari, 3abhishek desai, 4 shahid khan, 5dipashri sonawale

The goal of our project is to create an autonomous robot which intelligently detects the obstacle in its path and navigates according to the actions that we set for it. So what this system provides is an alternate to the existing system by replacing skilled labor with robotic machinery, which in turn can handle more patients in less time with better accuracy and a lower per capita cost.

5. A Novel Design for the Autonomous Line Follower Robot Using Microcontroller PIC16F676Hossain MI1, Islam SMR1, Rahman MM2* and Quamrul Hasan ASM

Autonomous Line Follower Robot using Microcontroller PIC16F676 has been solely conducted by the authors under their supervisor's guidance and based on an original design by the authors and extensively researched and verified not any replication of any previous models using the same components, design and circuit layout.

Methodology and design:

Line follower robots are autonomous robot have willing to detect and follow a line using on board hardwired managed circuit . Now a days, to diminish human effort and ensure efficient automatic transport system line followers are being getting popular.

The ultrasonic sensor library has to be installed in NODE MCU. In the program both IR sensors have to be initialized along with Four output pins of the motor have to be initialized. Three variables has to be declared, two for both the IR sensors and one for the ultrasonic sensor. The variables which are declared for the IR sensor will read the value of IR sensor1 and IR sensor2. The variable which is declared for the ultrasonic sensor identify for any obstacle upto mentioned distance. If the ultrasonic sensor detects any obstacle in its path the motor should stop, the four output pins of the motor driver should be programmed as LOW, which means they should stop working. So, when an obstacle is detected by the ultrasonic sensor then the motors will stop and the robot will stop till the obstacle get eliminated from its path. When no obstacle and no black line is detected then the robot should move forward.
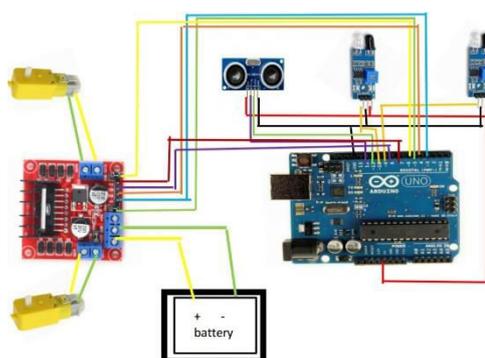

Fig; circuit diagram of Bot

Obstacle Avoidance

Obstacle avoiding robot is an smart tool which can naturally sense the obstacle in front of it and avoid by turning itself in another direction .This design let therobot to navigate in unknown environment by avoiding collision, which is primary requirement for any autonomous mobile robot In robotics, obstacle avoidance is a task of satisfying some control objective subject to non-intersection or non-collision position constraints An obstacle avoidance is a type of autonomous mobile robot that avoids collision with unexpected obstacle. In this project obstacle avoiding robot is designed. It is an Arduino based robot which uses ultrasonic range finder sensor to avoid collision
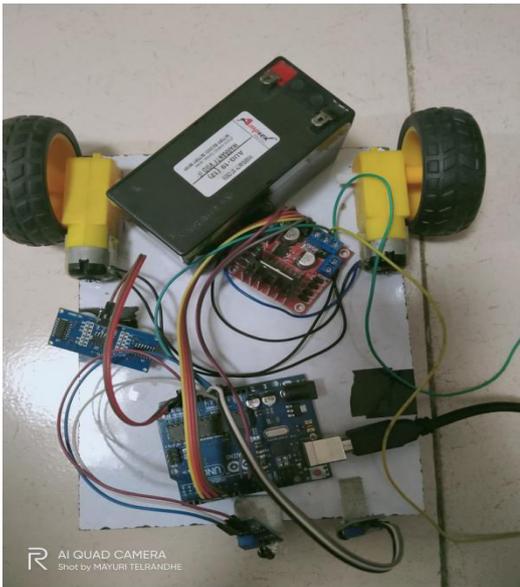
The Chassis Design:

The materials used for designing robot chassis are wooden plate, passive castor, DC motors and driver wheels. While choosing this material we must focused the resistance, weight and mechanical ability. The figure below shows the block view of chassis.
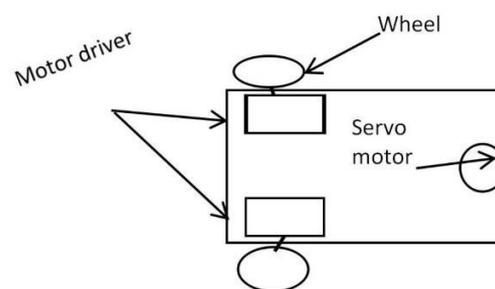
Fig; the chasis design

Experimental results:

The proposed bot is shown in figure below. This result shows the complete circuit photos in figure.

References :

[1] A line follower robot from design to implementation: Technical issues and problems, Mahdi Rezaei Ghahroudi.

[2] Smart and Intelligent Line Follower Robot with Obstacle DetectionM. Sri Venkata Sai Surya1 , K. Bhogeshwar Reddy2 , K. Pavan Kalyan3 , S. Senthil Murugan.

[3] Development and Applications of Line Following Robot Based Health Care Management System.

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[5] A Novel Design for the Autonomous Line Follower Robot Using Microcontroller PIC16F676Hossain MI1, Islam SMR1, Rahman MM2* and Quamrul Hasan ASM

Future Scope:

This paper is all about line follower robot carrier and obstacle avoiding Bot using Arduino which will follow a specific path or line and carry text message which is displayed on the mobile application which is placed on chassis. In future this project can be enhanced by replacing with GPS which improve the efficiency of BoT. The screen is connected by wifi so that message entered by admin is directly display on screen and data enter by end user also stored in the database. The admin can see the end user activity on his screen by sitting at just one place.

Conclusion:

The making of line following robot means integration of electronics, mechanical system using programming. This project is completed and finished with the help of Arduino-UNO , motor driver, line tracing sensor, ultrasonic sensor and programming. In this project the message is send to the destination by avoiding obstacles. The project can be advanced as an messaging application is there to carry the text message by admin to the end user and stores the data entered by end users which is directly display in the data base