Material Delivering Robot using Line Guided Vehicle

[1]Bhoomika M, [1]Gayathri S, [1]Kavya R K, [2]Spoorthi Y
[1]Students, Department of ECE,GSSSIETW-Affiliated to VTU, Mysuru, Karnataka, India
[2]Assistant professor, Department of ECE,GSSSIETW-Affiliated to VTU, Mysuru, Karnataka, India

Abstract-**Humans have a proclivity for looking for solace. They are always looking for new ways to diversify their everyday routines and jobs. self-contained. Pick-and-place concept and-place, as well as a robot that clears obstacles will be carried out in accordance with a certain set of instructions line, might be able to assist a business in reducing the amount of pollution it produces. cost of labour or possible substitutes hard work The industries are always changing. Industries are increasingly adopting the concept of automation, and robots are the best option for this In most cases, one sort of robot is used industry is a manipulator robot or just an arm made of metal It can be either open or closed. linked kinematic network of stiff links Through means of moveable joints. We have a mechanical arm with a line follower robot that will be able to choose an article from a container then transport it to the specified location by following a predetermined path along Servos can be used to clear the obstacle a vehicle approaching the line's lane.**

KeyWords: Arduino NANO, Ultrasonic sensor, IR sensor, Servo motor, Robot Mechanical arm claw.

I. INTRODUCTION

Robotics is an engineering science and technology field concerned with robots, including their design, manufacture, application, and structural disposition. Time and manpower optimization is a critical issue in a rapidly growing society. Automation has an essential role in reducing human effort. There was a law for robots back then called "The Three Laws of Robotics," which are still relevant for real robots today. The robots' three laws are as follows:

The first rule is that a robot should not harm a human being or allow a human to be injured by inaction. Second law: A robot must accept human commands unless they conflict with the First Law. Third law: Unless the First or Second laws contradict, a robot must safeguard its own existence.

A robot that follows a path is known as a line follower robot. It's an electronic device that can track out and follow the floor's line pattern. The line follower robot is a prototype model that was built for the purpose of material handling. The object carrying robot is a microcontroller-based mechatronic system that locates an object, picks it up from its initial point, and transports it to a predetermined destination. A robotic arm is utilised to pick up the thing. A robotic arm is a robot manipulator that mimics the functions of a human arm by using a sequence of functions controlled by a computer software. With the use of several types of magnetic sensors, an intelligent line following robot is built that can adjust the performance of the movement. The robot arms can be self-contained or operated manually, and they can execute a wide range of activities with excellent precision. Both the hardware and software programming of pick-and-place line follower robots are being enhanced at the same time.

The main control system for the robot is the Arduino NANO. It's one of the most basic and user-friendly. It is quick to respond and ideal for light work. The claw will be used to lift and put the object after it is detected by the sonar sensor.

II. LITERATURE SURVEY

The line follower and pick and place robot[1] by Sri Jagath H R, published In IRJET , Feb 2020.This paper presents the development of an automatic pick and place robot arm controlled using Arduino NANO. The pick and place robots are popular in industries, where repetitive tasks are present . Line follower robot is known as a learning tool for Automation. It is machine that follows a line either a black line on white surface or vice-versa. Android controlled pick and place arm with line follower automation[2] by lwin Htay, Nyan Phyo Aung, Mo Myint Wai published in (IJTSRD) international journal of trend in scientific research and development(IJTSRD), ISSN : 2456 -6470 , volume-3 ,issue-5, August 2019 .This paper presents the pick and place robot with line follower function for manufacturing application. Manufacturing automaton is widely used in small and medium plants, however, automaton cooperating with other devices is an important aspect for achieving the fully autonomous system.

Automatic pick and place robotic arm vehicle[3] by Prof.Vijay Matta ,Namita Mendole ,Leena Lengule ,Nidhi Hatwar, Pragati Manohare ,Neha Meshram ,Shipa Negdeote published in (IJARCCE)International journal of advanced research in computer and communication engineering. Vol.7,issue 2 ,Feb 2018.Line follower robot [4] by Abhijit .G. Kalbande , Shraddha.O. Koche .published in Journal for research ,vol 4, Issue 1 ,March2018. It is programmed to move automatically and in accordance with the plot line One of the most crucial features of robotics is line following. A Line Follower Robot is a self-contained robot that can follow a black or white line drawn on a surface of contrasting colour. It is programmed to move automatically and in accordance with the plot line. Design and implementation of a sensor guided pick and place robot[5] by S.H. Sushmitha and Uma Priyadarshini published in International journal of pure and applied matheamatics .vol 119, No.16 2018, 2939-2945. ISSN: 1314-3395. In this paper , an autonomous robot with 3 different functionalities is developed . Sensor Guided Robotics (commonly known as autonomous robotics) comprises of robots which function depending on inputs from sensors and are controlled with the help of microcontrollers. As part of this project, three different basic autonomous robots which are guided using sensors will be designed. The first robot will be a line follower which is programmed to follow a line. A conceptual design of line

follower pick and place robot [6] by Maruf Ar Rusafi , Md Mashum Bilal , Farjana Yasmin , Rukunuzzaman Khan. December 2017 international conference on mechanical, industrial and materials engineering 2017(ICMIME2017)28-30 December, 2017, RUET. This paper reports on the robot is capable enough of carrying object and pick and place to specific places. Mankind is habituated to seek comfort.

A novel design for autonomous line follower robot [7] by Md. Majedur Rehman, Hossain Mi, Islam Smr, Rahman MM May 2017 Journal of electrical engineering and technology (JEEET). The line following paper proposes a new model The Autonomous Line Follower Robot is a mobile machine that can recognise and follow a pre-drawn line that may be seen as a black line on a white surface with a high contrasting colour. Technical report of building a line follower robot [8] by Sayedehson Marjani Bajestani , Arsham Vosoughinia .IEEE 2017. The following robot is a temporary intelligent system with robot positions corrected feedbacks, aiming for the black or white line. The voltages of the circuits and the voltages of the sensors are the main sources of income for robots. The following robot is a temporary intelligent system with robot positions corrected feedbacks, aiming for the black or white line. The voltages of the circuits and the voltages of the sensors are the main sources of income for robots..Pick and place ABB working with a linear follower robot [9] by Nwokomah Wilson Gosim, Tarig Faisal HMA A AL-Assadi. Published in international symposium on robotics and intelligent sensors 2012 (IRIS 2012). The necessity for higher manufacturing output in industries prompted the development of this project proposal. Industrial robots are commonly utilised in small and medium workshops; nonetheless, the robot's ability to collaborate with other devices is critical to developing a fully autonomous system.

III.PROPOSED SYSTEM

In our project, we have proposed a line follower robot that can pick up an object from a certain location and transfer it to a predetermined location by following a predefined line, as well as clear obstacles..
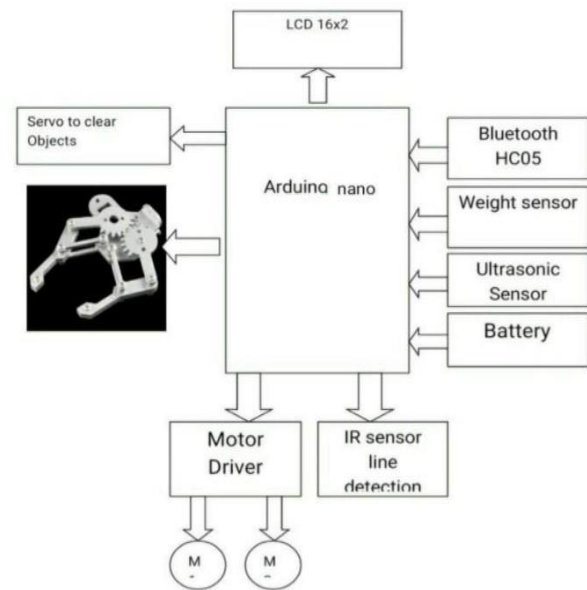
IV.SYSTEM DESIGN

The hardware requirements of our project are Arduino NANO, IR sensor module, Motor driver module, Robotic arm claw, 12v battery, Connecting wires, Ultrasonic sensor, Bluetooth HC05. The software requirements are Arduino IDE, MIT App inventor. An infrared sensor array beneath the front of robot.)It detects the line and sends an ADC a fluctuating voltage signal (Analogue to Digital Converter). The ADC sends a binary signal to the Microcontroller based on the sensor array (Arduino).A sonar sensor with a front- when it detects an object in front of it The controller then instructs the wheel motors to come to a complete stop. It also transmits a signal to the servo motor at the same time. At the same time, it sends signal to the servo motor and clear out the way to robot. claw will be used to pick and place the objects from source to destination wirelessly using Bluetooth and also robot can be stopped in emergency of dropping the object carried by robot over the line of path also over this project load cells are used to see the weight of payload in order to over come ,over weight load adding on robot The following figure serves as a visual
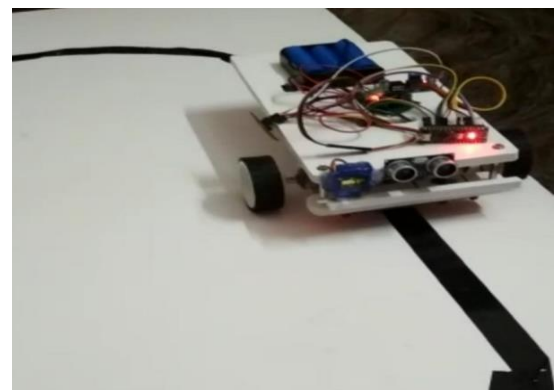
representation of the overall functioning principle.

Fig.4.1 Block diagram

V. RESULT AND DISCUSSION

The following figure shows the result of our project.

The robot will have the ability to follow a line. It will be capable of carrying objects and picking and placing them in particular locations using a Bluetooth-controlled arm. Pick and

Special Issue - 2021

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCCDS - 2021 Conference Proceedings

place robots are common in businesses with a lot of repetitive work.

VI.CONCLUSION

In factories and industries, robots will be utilised instead of humans to save labour and transportation costs. Aside from following a predetermined path, the robot will also carry the required load. The RMA industry, supermarkets, libraries, hospitals, and residential applications will all benefit immensely from it. It will meet their greatest requirement for transporting items in a safe and efficient manner. Although it is a prototype, there may be some flaws, the final product will include all of the following features..

In this project we are designing a line following pick and place robot. In factories and industries, robots will be utilised instead of humans to save labour and transportation costs. The robot will be capable of carrying objects and picking and placing them in particular locations. We are designing a prototype model , which can effectively replace a material handling vehicle in industry in very effective manner.

Above all, the robot will save time, which is one of the most significant components in achieving speedy production. So, without a doubt, it can be used where it is required.

VII.REFERENCES

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