

# LINE FOLLOWER ROBOT

Submitted by-

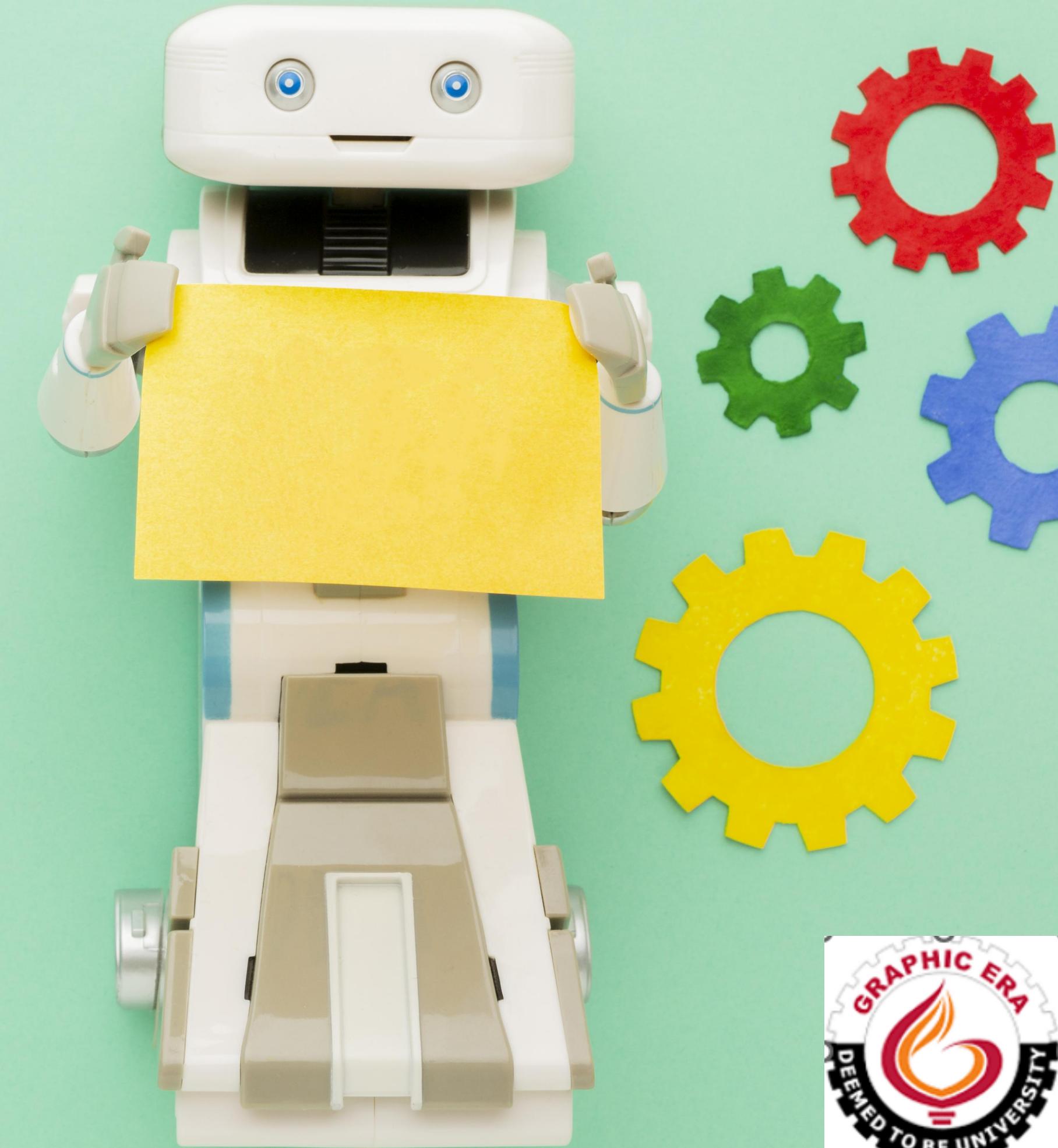
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# **INTRODUCTION & PROBLEM STATEMENT**

To design and build an autonomous line follower robot capable of navigating a predefined path marked with a visible black line on a contrasting background.

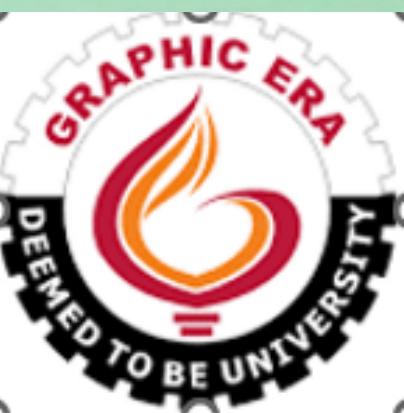
A robot is a smart machine that can do things on its own. It can follow instructions from someone or make decisions by itself to do various tasks automatically.

The Line Follower Robot is an autonomous device designed to trace a predefined path guided by a visible line on a given surface with contrasting colors.



This project makes the use of arduino, IR sensors, and motors to develop a line follower robot. The main goal is to enable the robot to follow a visible black line on a surface. By the help of IR sensors, the robot detects the line's position and promptly adjusts its movement, ensuring it remains on the track.

The Arduino microcontroller plays an important role in processing the sensor data and executing precise adjustments and movements, thereby maintaining the robot's alignment with the designated path from start to finish.



# METHODOLOGY

This project is about creating a smart robot that can follow a line all by itself without any human help. The robot has special sensors to detect the line on the floor, and it uses an Arduino computer to control its movements.

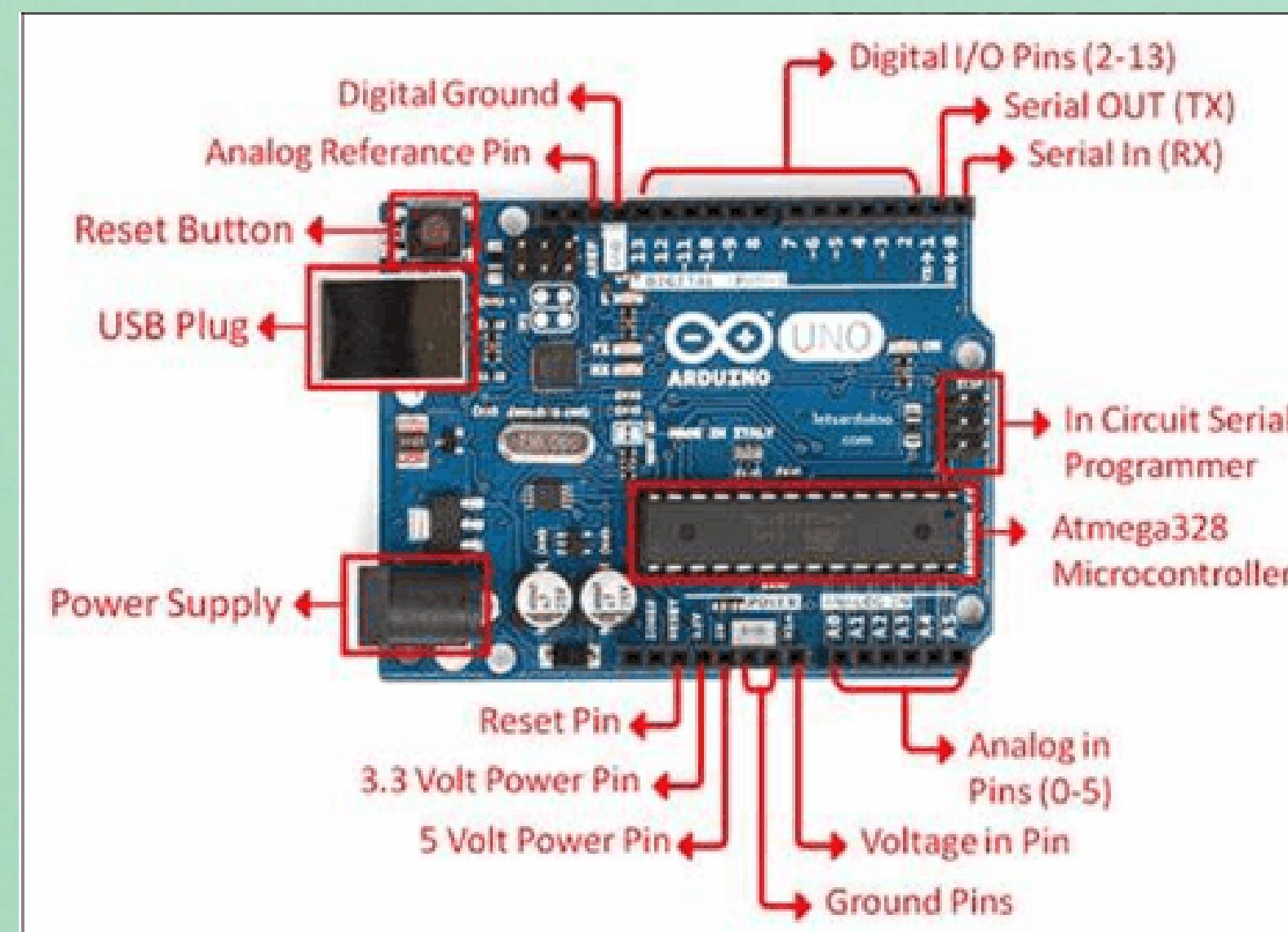


Fig: Arduino UNO



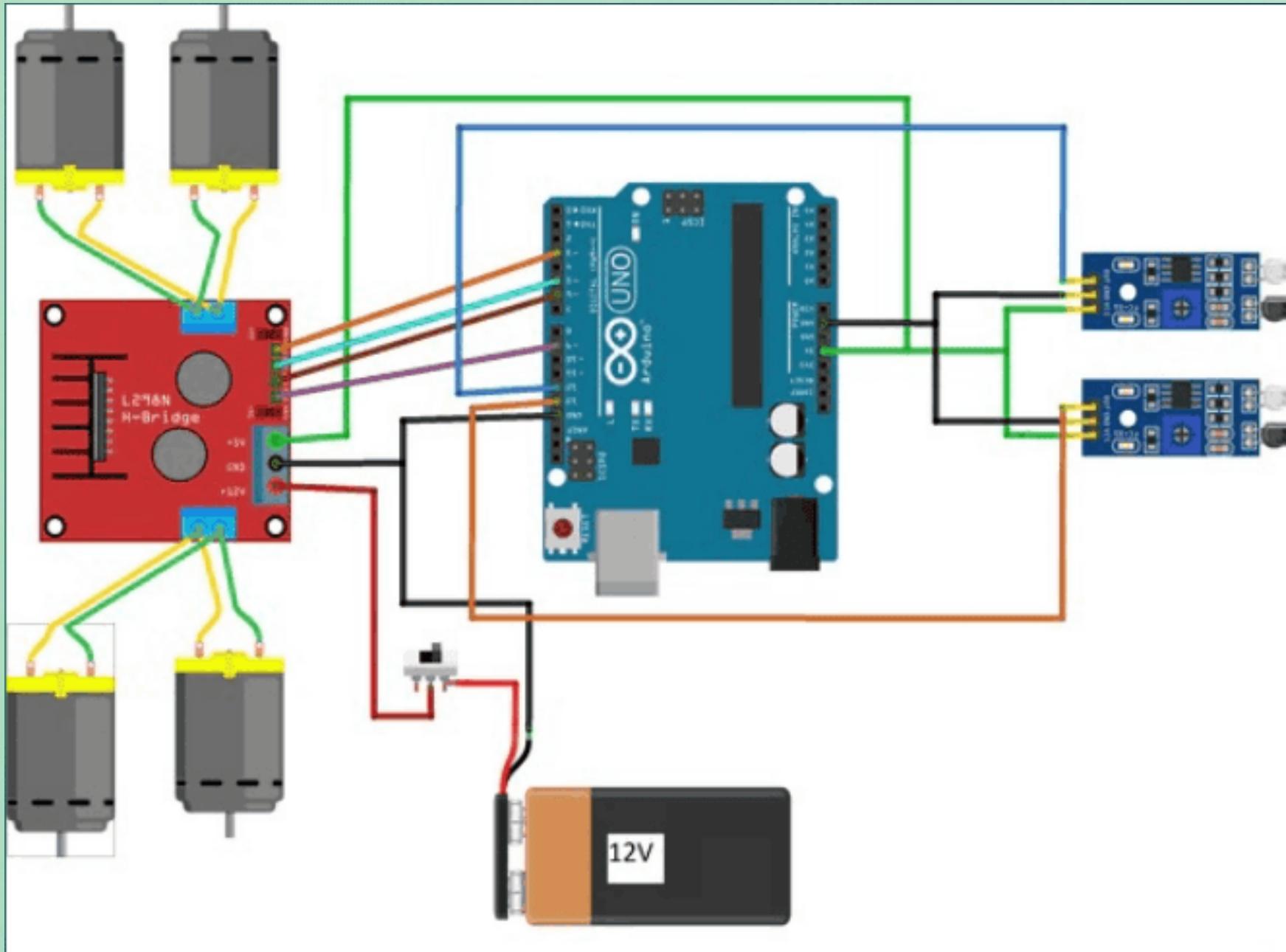
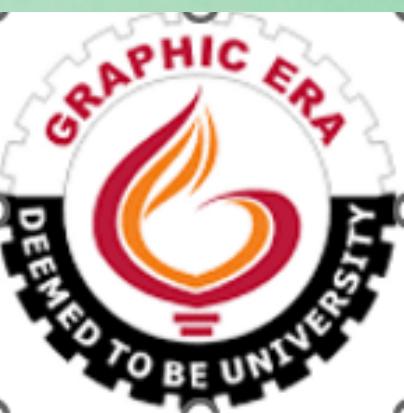


Fig: Circuit diagram of the model

When the robot senses the line, it decides whether to go left, right, or stop, depending on what it is told by the sensors. The robot has some important parts like the sensors, the Arduino computer, and the motor driver to control its wheels. By putting all these things together, the robot can follow the line accurately and move around on its own.



In this project, the robot detects the line using infrared light. It has two IR sensors placed on its sides, with the line in between. The sensors send out infrared light, and when it hits the black line, it's absorbed, giving a low output. But when it hits the white surface, it reflects back to the sensor, giving a higher output. The robot's microcontroller reads these signals and controls its wheels accordingly. If both sensors see the line, it stops; if only the left or right sensor sees it, it turns in that direction. This way, the robot can follow the line on its own.

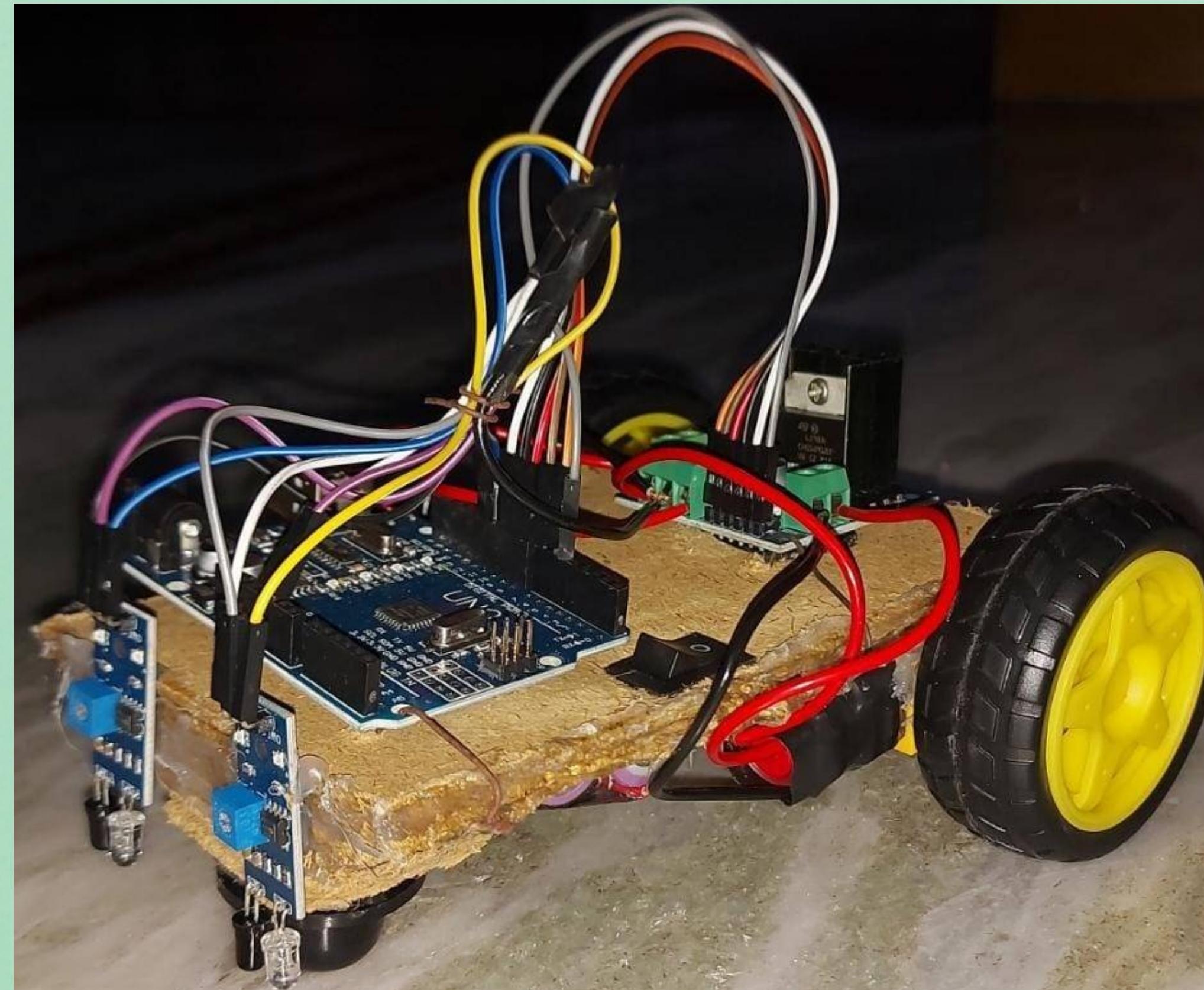


# **RESULT & DISCUSSION**

This project presents an intelligent system that can detect lines on a surface and has many uses in different industries like manufacturing, healthcare, and services. The system uses special sensors that can see infrared light to find lines. These sensors tell a small computer called Arduino if they find a line or not. This information can then be used to do adjustments and forward movement of the robot.



The following picture shows the final model of the line follower robot developed.

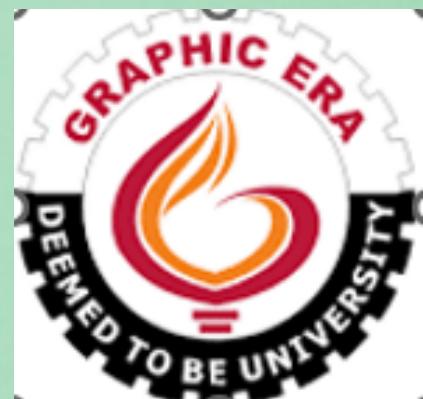


Line follower robots have real-time applications in various sectors, including warehouse material handling, agriculture, manufacturing, logistics, healthcare, education, and entertainment:

1. Agriculture: Line follower robots help farmers plant seeds in straight rows for better crop growth.
2. Manufacturing: Robots transport components along assembly lines, improving workflow and reducing manual work.
3. Warehousing: Robots aid in package transportation, optimizing order processing in warehouses.
4. Healthcare: Robots deliver medical supplies in hospitals, reducing human contact and errors.



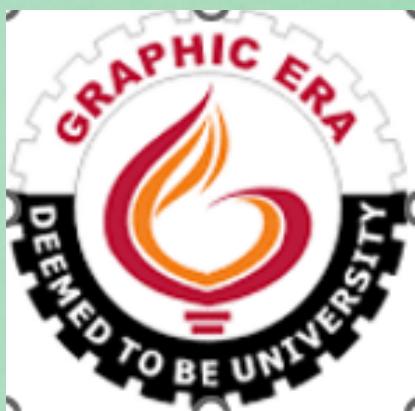
- 5. Education:** Line follower robots are used as educational tools for teaching robotics and programming.
- 6. Entertainment:** Theme parks employ line follower robots for interactive displays and guided tours.



# **CONCLUSION & FUTURE WORK**

The focus of this project is on the development of a Line Follower Robot utilizing Arduino. This robot shows the ability to follow a predetermined path using the sensors.

In the future, potential enhancements can be made which includes connecting a Bluetooth module and a camera, allowing users to remotely monitor detected obstacles on their screens; integrating various sensors to detect multiple colors; and design to enhance speed. The line-following robot has the potential to become a reliable companion of humans to assist and improve various aspects of daily living.



# THANKYOU

