

IC 201P – Design Practicum

LINE FOLLOWER ROBOT FOR INTERSECTING LINES

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AIM:

- .The aim of this report is to provide a detailed explanation of the idea behind a line follower robot which also includes intersecting lines.
- .This report will also provide an overview of the algorithm used by the robot to follow the desired path and how the algorithm will work at intersecting lines.
- .This report will explain that our report needs a chassis, motors, sensors, microcontroller and a power source and it will also highlight the importance of selecting appropriate components that are compatible for the robot to move without toppling.

CONTENTS:

- PROJECT OVERVIEW
- BLOCK DIAGRAM
- CONTENTS USED
- WORKING OF ROBOT
- APPLICATION
- ADVANTAGES
- LIMITATIONS
- FUTURE SCOPE
- FEASIBILITY
- CONCLUSION

OVER VIEW:

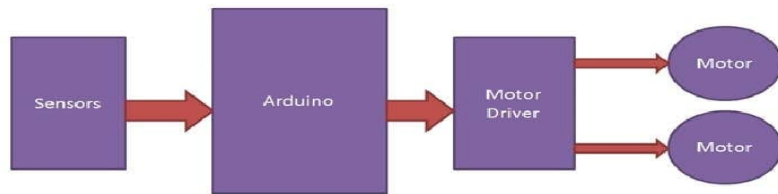
- The main objective of the project is making a robot which senses a particular path and then follows that path which also includes intersecting paths.
- Initially the robot moves on its black path. The Infrared sensors on the robot helps the robot in navigating .

COMPONENTS:

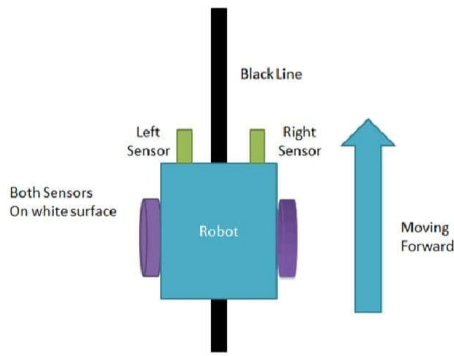
- **ARDUINO-** The arduino microcontroller is an easy to use yet powerful microcontroller. It controls the motors based on the sensor input.
- **INFRARED SENSOR-** The infrared sensor is used to detect paths. It works by emitting infrared light and detecting the reflection from the surface.
- **MOTOR DRIVER-** The DC motors are responsible for moving the robot. The motors are connected to the wheels of the robot and are controlled by the motor driver. The speed and direction of the motors are controlled by the microcontroller based on the sensor input.
- **DC MOTORS-** The DC motors are responsible for moving the robot. The motors are connected to the wheels of the robot and are controlled by the motor driver.
- **BATTERY-** The battery is used to power the robot. The battery used in this robot is typically a rechargeable lithium-ion battery.
- The robot continues to follow the lines until it reaches the end of the path or encounters an obstacle.

WORKING OF ROBOT:

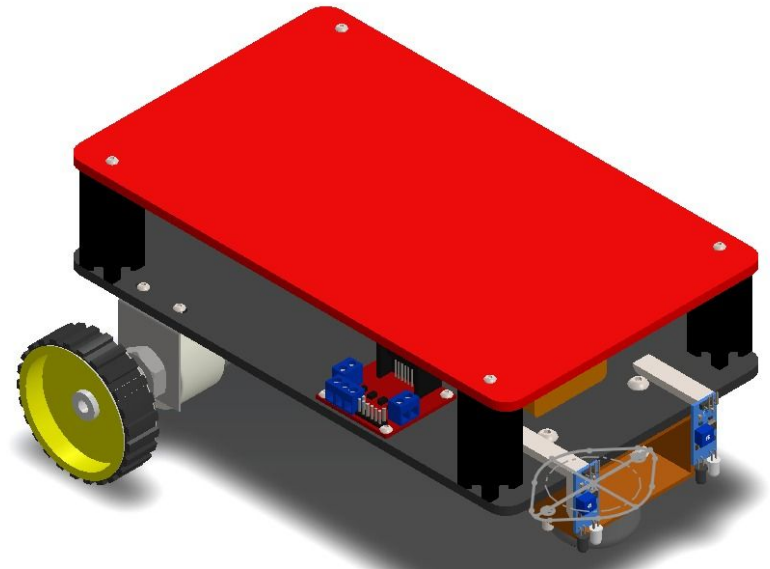
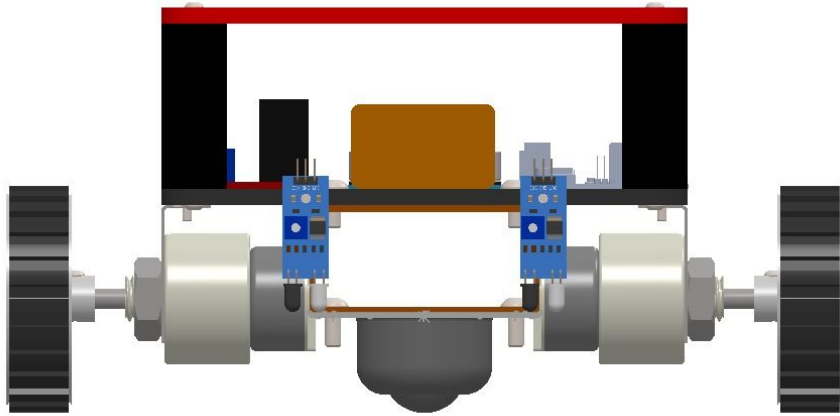
- Working of the line following robot is very interesting. Line follower robot senses black line by using sensor and then sends the signal to arduino. Then arduino drives the motor according to sensors output.

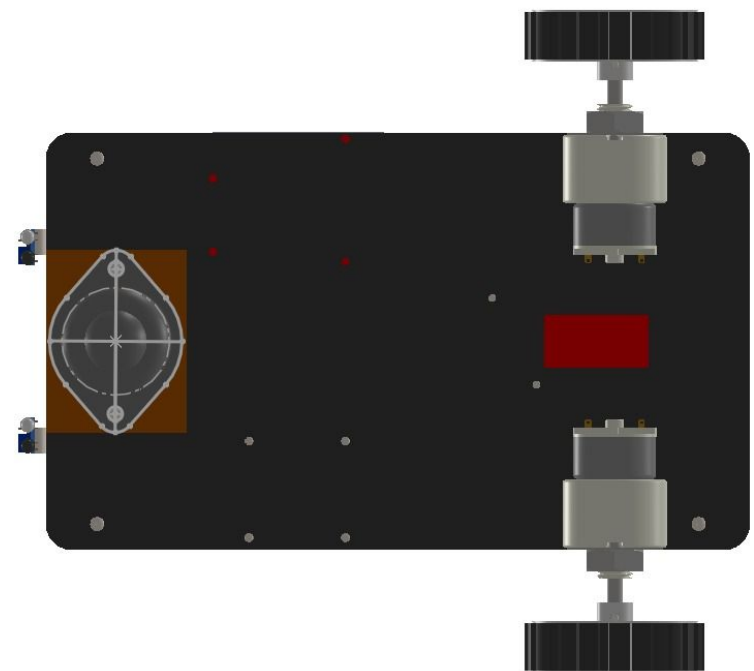
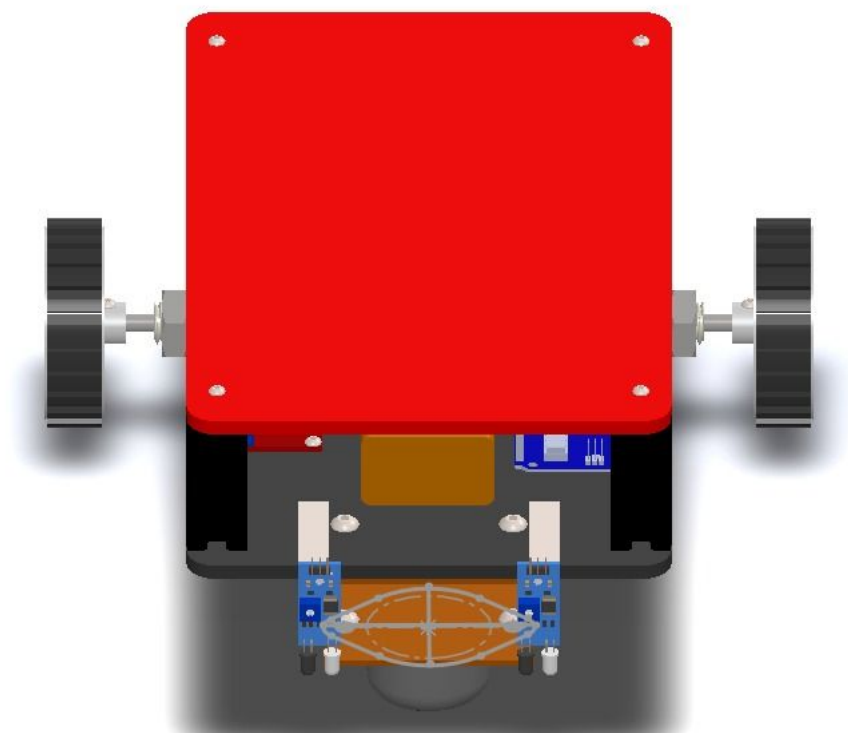


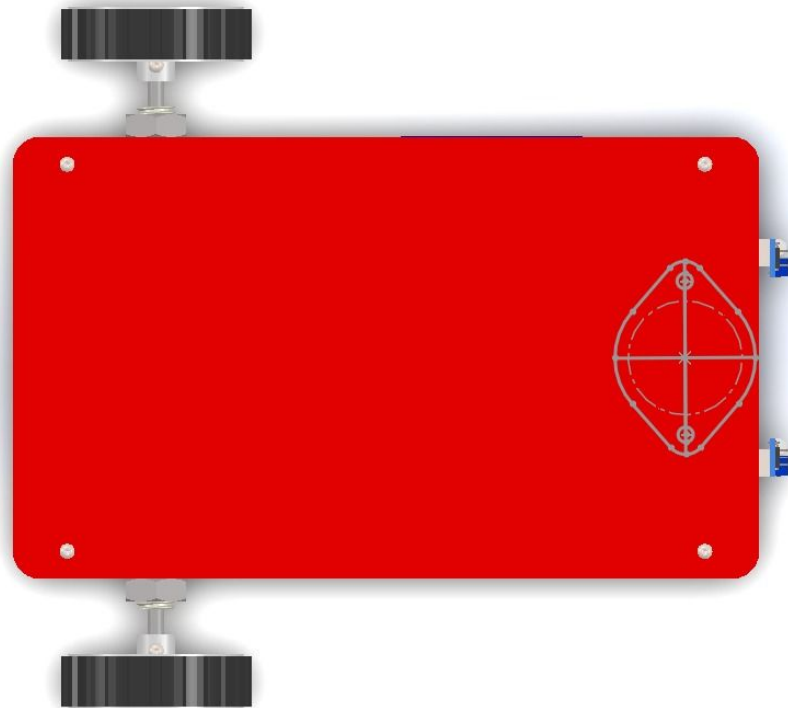
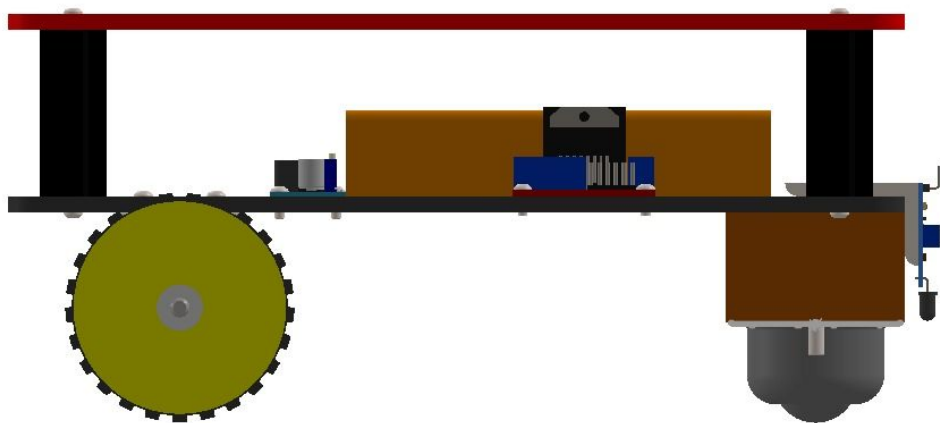
Here in this project we are using Infrared sensors. When both left and right sensor senses are white then, robot moves forward.



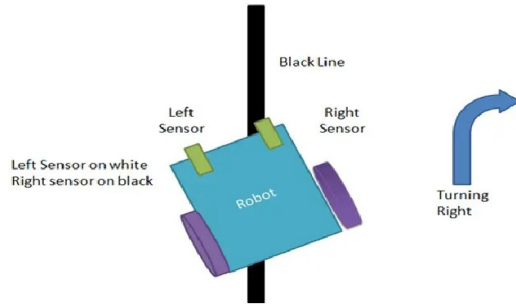
CAD MODEL



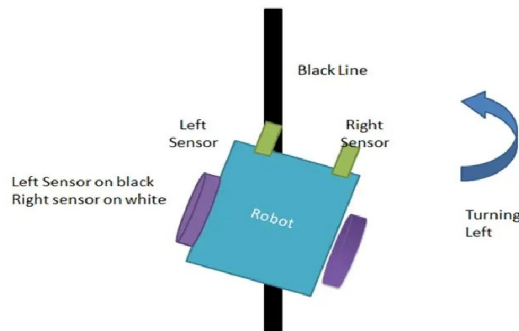




If right sensor sense black line then robot turn right side until both sensor comes at white surface. When surface comes robot starts moving on forward again.



If left sensor comes on black line then robot turn left side.



APPLICATIONS:

- We can use line following robots in industries for carrying goods.
- It can be used in public places like historic sites or museums etc to provide path guidance.
- These robots can also be used in homes for floor cleaning etc.

ADVANTAGES:

- Our line following robot is automatic.
- Its simplicity of building can be counted as an advantage.
- Can be used for domestic as well as industrial purposes.
- Can be easily operated.

LIMITATIONS:

- It always need a black line or path to move.
- Slow speed and instability on hard angles or curved paths.
- The infrared sensors may sometimes absorb IR rays from surroundings also. As a result, robots may not work properly.

FUTURE SCOPE:

- Further improvement can be done in the robot by adding more IR sensors in our robot.
- We can also add additional programming to find its own shortest path among given paths from start point to end point .
- We can also add speed regulator to control the speed of the robot.

FEASIBILITY:

The feasibility of building a line following robot depends on several factors, including the cost and availability of components, technical skills required and time required to complete the project. The cost of components can vary depending on the quality and quantity of components used. Technical skills required include knowledge of electronics , programming and mechanical design. Time required to complete the project can also vary depending on the complexity of the robot and the skills of the builder.

CONCLUSION:

The line following robot is automobile system that has ability to recognise it's path, move and change the robot's position toward the line in the best way to remain in track.

The line following robot project challenged the group to cooperate, communicate and expand understanding of electronics, mechanical systems and their integration with programming.