Report on Maze Solving Robot

Project Description

A Line Follower Maze Solving Robot that uses PID Control is a sophisticated machine that employs a proportional-integral-derivative algorithm to maintain accurate and stable control over its movements. The robot utilizes a IR sensor to detect a line on the ground and follow it through a maze while using the PID control algorithm to adjust its speed and direction in real-time. The PID control system continually measures the robot's position relative to the line, calculates the error, and adjusts the robot's movement to minimize the error. This approach allows the robot to maintain a high level of precision and speed while navigating through complex maze structures. Overall, the use of PID Control in a Line Follower Maze Solving Robot can lead to improved efficiency, accuracy, and effectiveness in maze solving applications. A Line Follower Maze Solving Robot that uses the LSRB (Left-Hand Rule with Backtracking) algorithm is a machine that follows a line on the ground while utilizing the LSRB algorithm to navigate through a maze. This approach involves always turning left at every intersection, and when it encounters a dead end, it backtracks to the previous intersection and tries a different direction until it reaches the end of the maze. A Short Path algorithm on a Line Follower Maze Solving Robot is a method that allows the robot to find the shortest route through a maze. The algorithm involves calculating the distances between each intersection and choosing the path with the shortest distance, leading to more efficient maze solving capabilities.

Structure Description

A typical Line Follower Maze Solving Robot consists of a microcontroller, a motor driver, a IR sensor module, Ultrasonic Sensor and a chassis. The microcontroller controls the robot's movements while the motor driver powers the motors. The IR sensor module detects the line on the ground, and the chassis provides the physical structure to hold all the components together. Additional features such as Bluetooth connectivity and LiPo battery support can also be added to enhance the robot's functionality.

Main Equipment/parts used

Arduino Uno
Motor Driver L298N
BO Motors
Ultrasonic Sensors
Infrared Sensors
Line Sensor Module
MDF Board(For Structures)
Castor Wheel

Experience in making the project

Our experience working on a Maze Solver Line Follower Robot was both challenging and rewarding. We learned a great deal about electronics, programming, and robotics. Throughout the project, we had the opportunity to work with various sensors, microcontrollers, and motors, and learned how to integrate them to solve complex problems.

We encountered several challenges along the way, such as accurately detecting the line, navigating the maze efficiently, and optimizing the robot's performance. However, overcoming these obstacles helped us develop problem-solving, critical thinking, and troubleshooting skills, which we can apply in future projects and careers.

Working on the project also encouraged us to be creative and innovative, as we experimented with different algorithms, designs, and components to enhance the robot's capabilities. Additionally, we worked collaboratively in teams to brainstorm ideas, share knowledge, and support each other throughout the process.

Overall, our experience working on a Maze Solver Line Follower Robot provided us with a valuable learning opportunity that developed both technical and soft skills. We believe that the knowledge and experience gained from this project will serve us well in future endeavors.

Experience from the visit of IIT BHU

Visiting IIT BHU with our Maze Solver Line Follower Robot project for a tech fest was an unforgettable experience. IIT BHU is a world-renowned institution for science, engineering, and technology, and being able to showcase our project there was a great achievement.

When we arrived at the tech fest, we were amazed by the various teams from across the country who were showcasing their projects. We had the opportunity to meet and interact with teams who were working on diverse projects, ranging from machine learning to robotics to augmented reality.

We also had the chance to explore the IIT BHU campus and attend various activities related to technology and innovation. We attended talks by renowned researchers, participated in workshops on cutting-edge technologies, and explored the many innovation labs on campus.

One of the highlights of the trip was meeting and learning from industry leaders and experts in various fields. We attended the talk session of Shri Haribabu Srivastava, Director General of DRDO. Shankar K. Pal, Computer Scientist, President, Indian Statistical Institute etc. We had the opportunity to hear their insights and experiences, ask questions, and network with them.

Overall, the trip was an incredible learning experience that exposed us to new ideas, technologies, and people. We returned to our college campus with a renewed sense of inspiration and motivation to continue working on innovative projects.

Our participation in the competition

We participated in a tech fest competition and successfully cleared the qualification round and the first round, earning a spot in the final round. Out of many teams, only 10 were selected for the final round, and we were excited to be one of them.

During the final round, we competed with the other teams, and while we did not win, we were proud of our performance. We had put a lot of effort and hard work into our Maze Solver Line Follower Robot project, and we received positive feedback from the judges and other attendees.

Even though we did not win the competition, we took the experience as a learning opportunity. We identified areas where we could improve our project and skills and came up with new ideas for future projects. We also congratulated the winners and celebrated their success, recognizing that they had put in just as much effort and hard work as we had.

Overall, participating in the tech fest competition and making it to the final round was a valuable experience that taught us a lot about innovation, teamwork, and perseverance.

How college helped us in our project

Our college played a crucial role in helping us make our Maze Solver Line Follower Robot project a success. The college provided us with the resources, infrastructure, and guidance we needed to design, develop, and test our project.

In addition, the college also provided us with funding to purchase the necessary equipment and materials for the project. This allowed us to focus on the technical aspects of the project without worrying about the financial constraints.

Overall, the support and resources provided by our college were instrumental in making our project a success. We are grateful for the assistance and guidance we received and hope to continue to utilize the resources and expertise of the college for future projects.

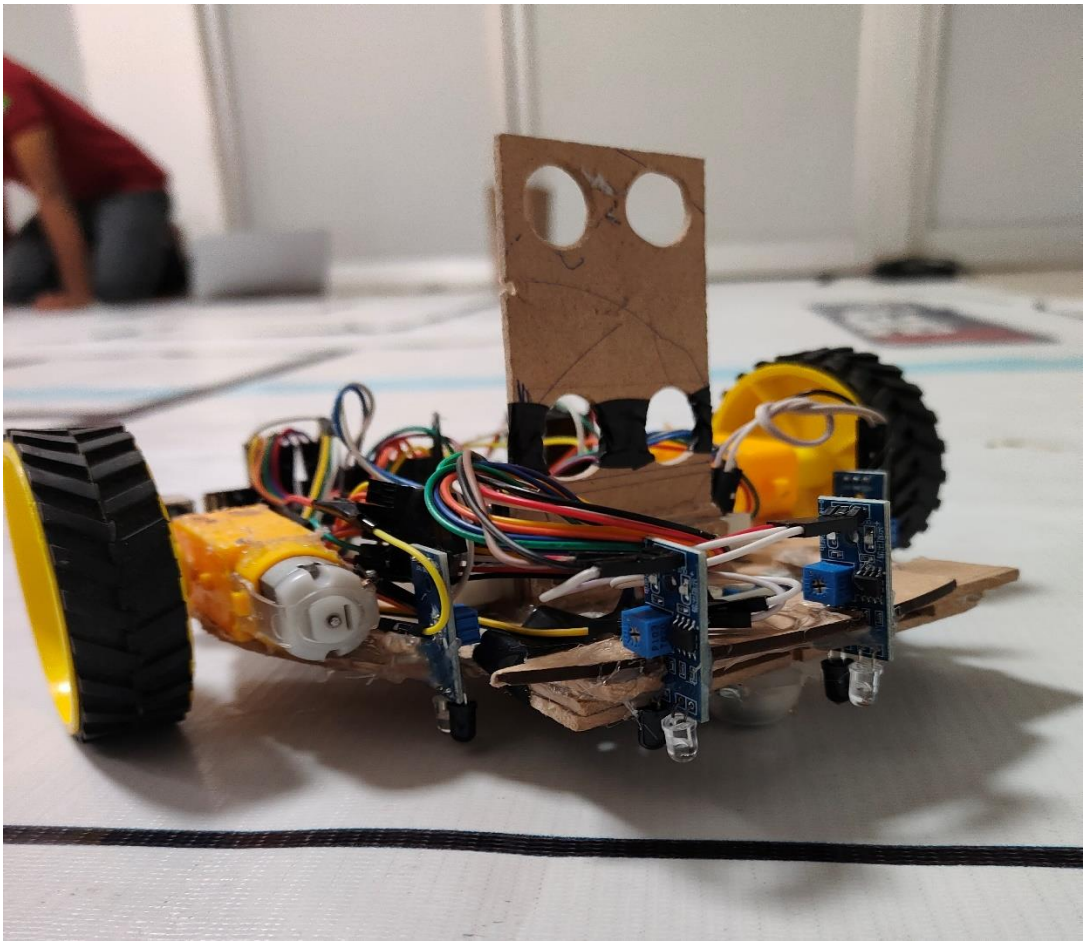
Members

1. Saurav Kumar (B210062EC)
2. Harsh Srivastava (B210048EC)
3. Tejas Khillare (B210095EC)
4. Ashutosh Kumar (B210043EC)
5. Puru Jindal (B210084EE)
6. Vishwajeet Kumar (B210096EE)

Team Description of Maze Solving Robot Project

7. Saurav Kumar (B210062EC)
8. Harsh Srivastava (B210048EC)
9. Tejas Khillare (B210095EC)

Some Photos of our trip and competition

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