

Maze solver



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Project idea



- Our idea is to create an autonomous bot, which, when presented with an arena, with a maze, starts from some start point, and goes to given final point.
- It actually explores the whole maze in the first go, and in the second chance, starts from the start point and goes to the end point in the shortest path.
- It does that using A-start algorithm or 3 pi algorithm(Our idea is to implement both the algorithms and try it on the bot).

Key challenges



- One of the main challenges is regulating the speed of the bot. At constant voltage, bot must move slower while exploring the maze, and faster when going through the maze in the shortest path.
- Another challenge is sharp turns. When turns are too sharp, bot may slip off the maze black line, resulting in bot deviating from the maze.
- Maintaining precision on the two motors of left and right wheels, so that movement is precise.

Responses



- First challenge can be covered using some tweaks in the code, like a flag or something, whether the bot is exploring, or going through the shortest path.
- For sharp turns, we plan to make multiple trials and select most suitable speed over a set of speeds.
- For maintaining precision, we try giving close values to the motors(almost equal), and check which values give most precise movement of wheels.

Additional hardware



- Motor driver circuits, Whiteline sensors, Arduino board, wheels, motors, Li-polymer batteries, Chassie.

Where can we fail?



- If the maze has loops, it may consume more time because it will cover each node in the loop always twice.
- If the maze has many loose branches going from the main path of the bot to the left way, bot may spend too much time on those branches.