ABSTRACT

Project Title: Intelligent navigation system for robots using A* search algorithm

This project focuses on creating navigation, for a self driving robot by enhancing the A star informed search algorithm for efficient path planning purposes. The main goal is to enable the robot to navigate through an environment avoiding obstacles and reaching its destination from the starting point in minimal time. The next algorithm, A* is employed for finding the efficient path compared to the uniform cost algorithm aiding in directing the robot along the least costly path with an estimated value of the longest route avoided, utilizing heuristics such, as Manhattan or Euclidean distance to approach the goal node swiftly compared to less informed search tactics.

The idea is to control the constraints for the moving objects present in the environment so that the robot can move safely and freely through the environment without any problems. It visualizes the layout of the grid along, with the robots movements and obstacles to provide a clear picture of the situation. the project also discuss about the heuristic functions efficiency and how they impact the search process regarding speed and effectiveness. In evaluating the algorithms effectiveness and efficiency levels can be determined by comparing the time taken to reach a solution ,the number of nodes explored during the process and the length of the path to get to that solution. The project gives a clear cut idea of how A* search's performance underscores its applications in practical scenarios such, as robotics, autonomous vehicles and other AI dependent navigation systems.