

Local Path Planning



CSCE Summer Intern Project for Undergraduate Student

Path Planners

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1 Executive Summary

The executive summary is a brief description of the project. The purpose is to give a quick overview of (1) the need, goal, and objectives, (2) the design and implementation, and (3) the expected results and benefits of the project. The intended audience of the executive summary is a program director, someone who makes decisions about which projects will receive funding. Since the executive summary is a summary, it should be written last.

2 Introduction

2.1 Assumptions

The following assumptions will be followed throughout the project:

1. The scenario takes place in a 2D environment.
2. The planned global path is fixed and given initially.
3. The obstacles are fixed and given initially.
4. The autonomous vehicle is a 4-wheel vehicle, which can be regarded as a 4.5 x 1.8m rectangular.

2.2 Need Statement

A way to implement a lane-changing algorithm so that the autonomous vehicle can avoid objects on its path, i.e. the road.

2.3 Goals and objective

The goals and objectives are as follows:

1. Compare existing methods of static path planning to:
 - (a) Conclude which algorithm performs the best in the given situation.
 - (b) Analyze room for improvement in the current algorithms if any.
2. Use a reliable path planning algorithm, i.e. if a solutions exists then the planner outputs at least one feasible solution.
3. Simulate the algorithms on various simulating platforms including but not limited to:
 - (a) OpenAI Gym
 - (b) CARLA
 - (c) Pygames
 - (d) Mathworks: Navigation ToolbocTM

2.4 Design and Feasibility

3 Literature and Technical Survey

4 Proposed Work

4.1 Evaluation of alternative solutions

4.2 Design specification

4.3 Approach for design validation

5 Engineering Standards

6 References

References

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7 Apendix