MATH 8650
Advanced Data Structures
Fall 2018

Term Project Proposal
Comparison of Optimal Path Finding

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1 Introduction

Pathfinding is the plotting of a computer application of the shortest route between two points. It is an essential part of many applications such as video games, robot navigation, road maps etc. Dijkstra's algorithm and A* are two popularly used algorithms for finding the shortest path. Dijkstra's algorithm explores all possible paths to find the shortest path while A* looks for a better path using a heuristic function.
In this project, we will do a comparison study between the two algorithms to find out which has better run time, complexity, efficiency and accuracy.

2 Goals

1. Implement A* algorithm
2. Implement Dijkstra's algorithm
3. Design test cases to validate the implementation
4. Compare the two for performance, accuracy and efficiency

3 Deliverables

1. Python implementation source code (Jupyter Notebook)
2. Report
3. Project Presentation

4 References

[1] https://en.wikipedia.org/wiki/Pathfinding

[2] https://en.wikipedia.org/wiki/A*_search_algorithm

[3] https://www.redblobgames.com/pathfinding/a-star/implementation.html

[4] https://stackoverflow.com/questions/13031462/difference-and-advantages-between-dijkstra-