**NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE**

**School of Computer Science and Engineering**
College of Engineering

# MAPF Visualizer

## visualize path finding algorithms with different maps

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## Project Objectives:

The project aims to create a web application for visualizing the detailed movements of multiple agents w.r.t different maps with two famous pathfinding algorithms (CBS and A*+OD). Furthermore, the execution time to find the paths w.r.t those 2 algorithms will also be shown in a chart form. Moreover, a proposed algorithm namely Grouping CBS that built on top of the CBS will also be discuss to show that it will be more efficient to compare to the original CBS algorithm in some cases. The experiment will also set up for comparisons between CBS and A*+OD as well as CBS and Grouping CBS

## Path Visualization:
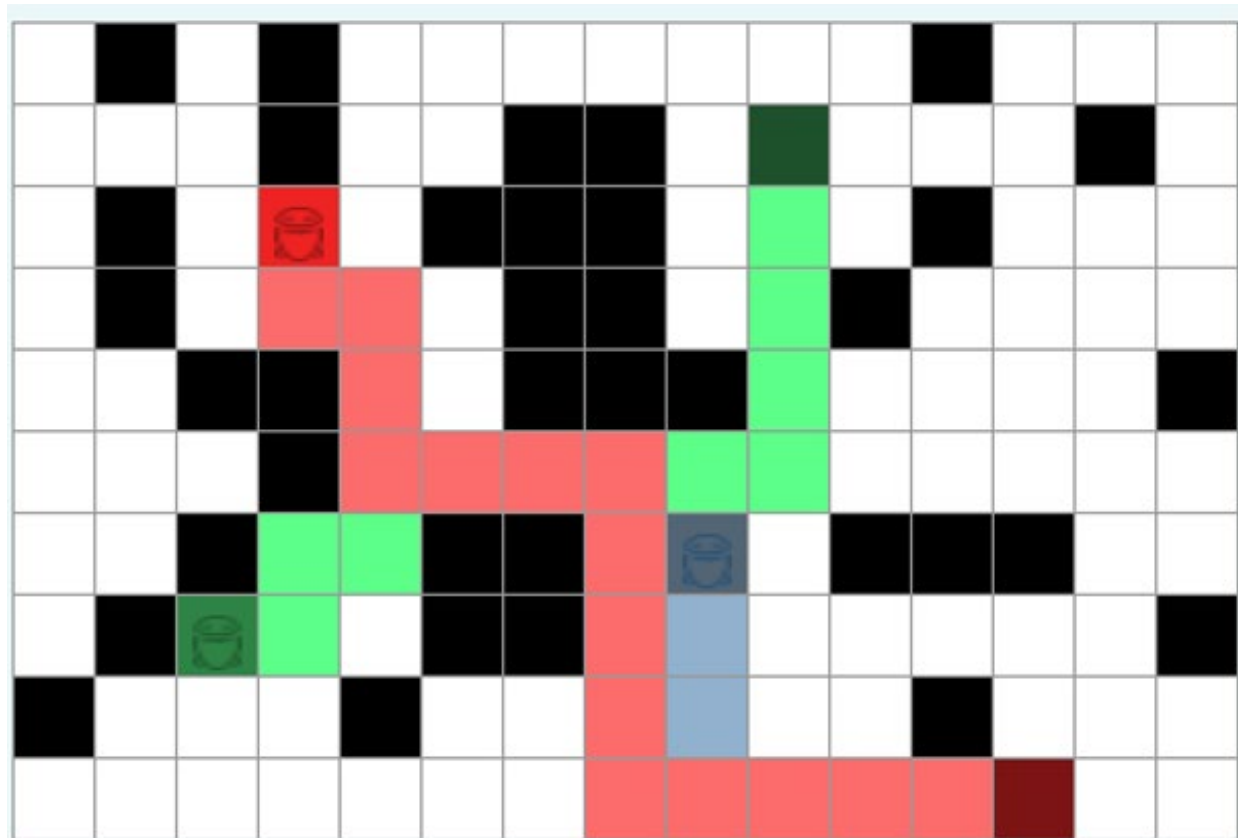


## Comparison charts:
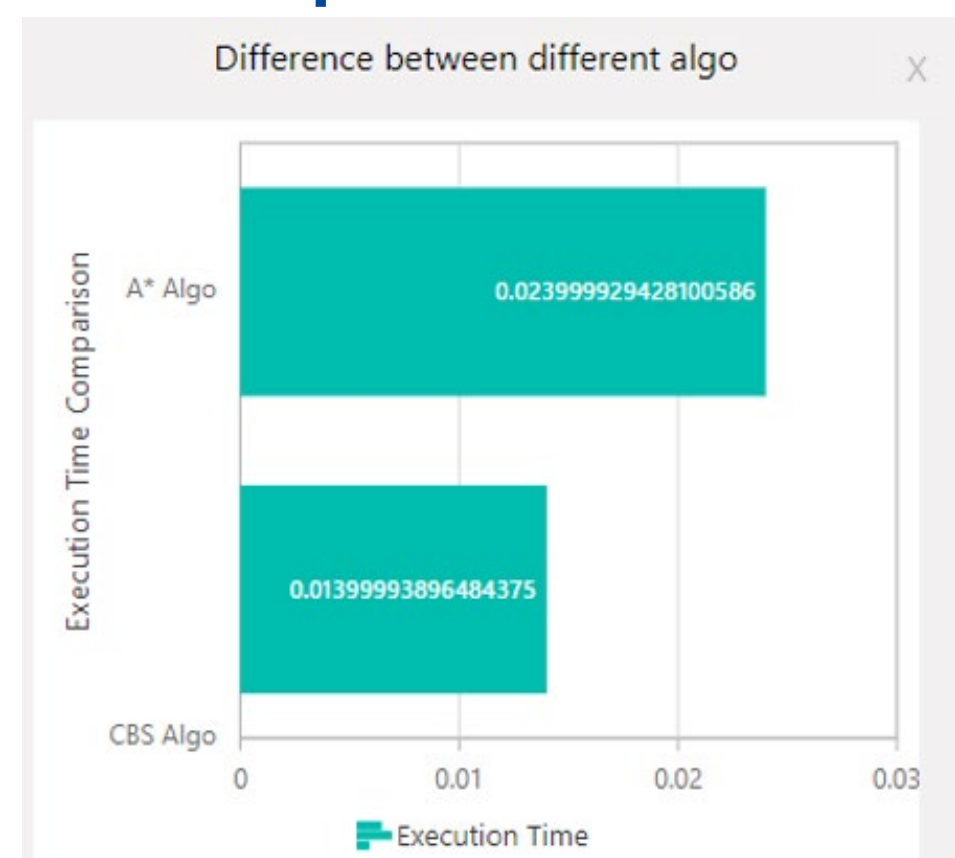


## Experiments between CBS and Grouping CBS:

With 100 tests, the number of agents randomly between 1-10 and the time limit is 5 minutes,

| CBS win | Grouping CBS win | Both take same time | Both failed |
|---------|------------------|---------------------|-------------|
| 43 | 40 | 14 | 3 |

The Grouping CBS perform reasonably comparable with CBS. The way distributed the agents into group is the key to the success of this proposed algorithm.

## Experiments between CBS and A*+OD:

With 100 tests, the number of agents randomly between 1-10 and the time limit is 5 minutes,

| CBS win | A*+OD win | Both take same time | Both failed |
|---------|-----------|---------------------|-------------|
| 78 | 24 | 2 | 0 |

The CBS algorithm perform better than A*+OD in most cases. In other cases, the map is more open-ended which is acknowledge for A*+OD to work better.