DSA Project pre-Proposal

Team members

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Description

Motivation

With the development of Autonomous vehicles, games and other advanced fields, the pathfinding algorithm is getting more and more important. So we want to research the performance of different pathfinding algorithms with the platform as a classic game Snake.

Algorithms

The idea of our algorithm comes from graph theory.

First, we are planning to implement three different pathfinding algorithms:

- Breadth-first search
- Depth-first search
- A* search

They are used to search a path from one node to another in a graph. But in our game the "snake" is a set of nodes.

So, then, we want to combine them with different strategies and build different self-playing AI models.

Finally, we would run those models on a snake game, test their performances, and try to find a optimal solution.

Experiment

Several stages will be implemented:

- Construct the map.
- Generate the food.
- Design some algorithms for moving the snake.
- check the snake if it's dead.
- compare the advantages between algorithms.

We will compare complexity of several algorithms:

- BFS
- DFS
- A*
- some other greedy algorithms or search algorithms.

- ...

if possible, we can extend this to the Graph Model.