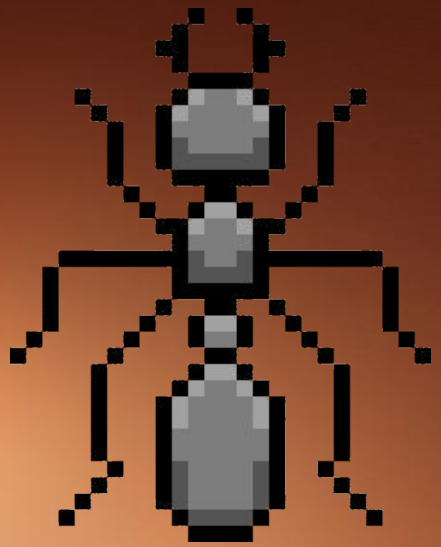
AntHill

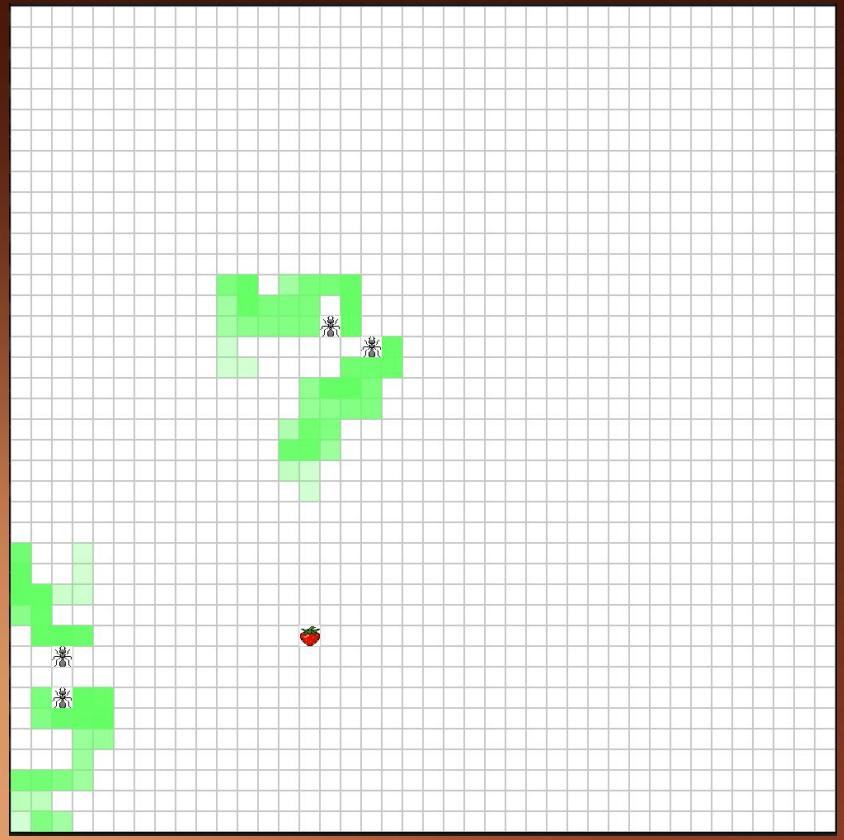
Environment

Agents



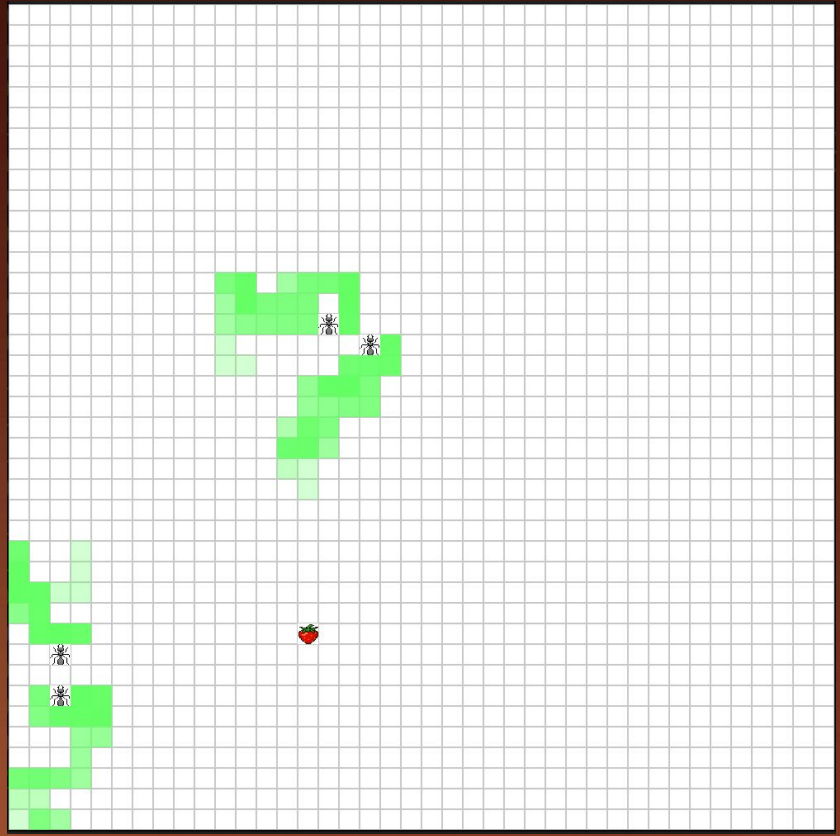
Goal

Multi Agent Search Environment



Multi Agent Search Environment

- Biologically inspired.
- Each ant releases pheromones.
- information regarding already explored paths.
- pheromones decay overtime.



Action Space

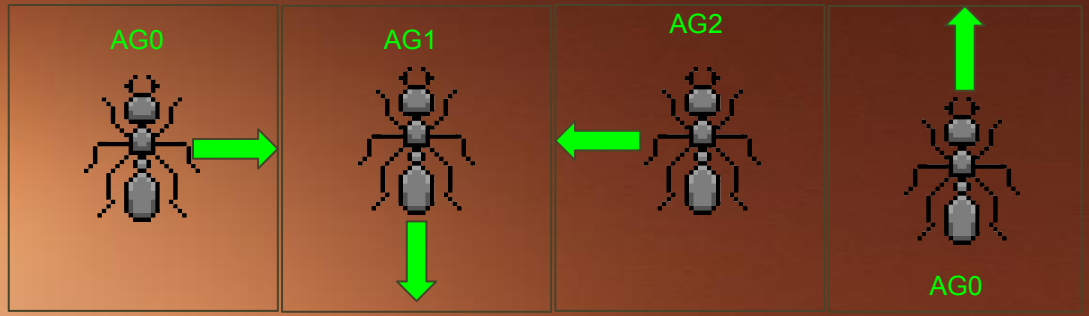
ActionVector: [0 3 2 1]

0 : right

1 : up

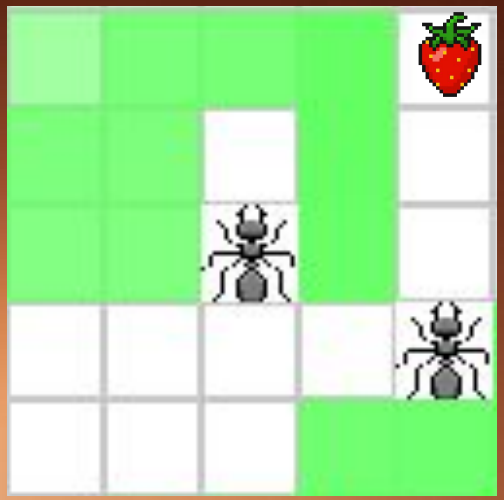
2 : left

3 : down



Observation Space

5X5 grid surrounding the agent



0 : empty

1 : pheromones

2 : Target

3 : Agent

```
array( [
        [1, 1, 1, 1, 2],
        [1, 1, 0, 1, 0],
        [1, 1, 3, 1, 0],
        [0, 0, 0, 0, 3],
        [0, 0, 0, 1, 1]
])
```

Reward

Shared reward:

- 1 if any agent got to the strawberry
- 0 Otherwise.

Goal:

- Encourage cooperation between agents in searching for the objective.
- Emergent Behaviours.
- Avoid other agents and pheromones to increase covered area and reach the goal.

Next Steps

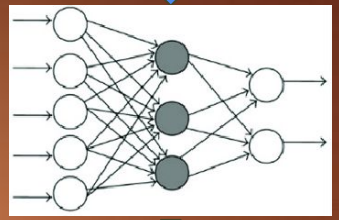
- Train Models

AG1

Agent

```
array( [
  [1, 1, 1, 1, 2],
  [1, 1, 0, 1, 0],
  [1, 1, 3, 1, 0],
  [0, 0, 0, 0, 3],
  [0, 0, 0, 1, 1]
])
```

Generates observation



Trained MLP infers on the current state

ActionVector: [0 3 2 1]

Sets next action on vector