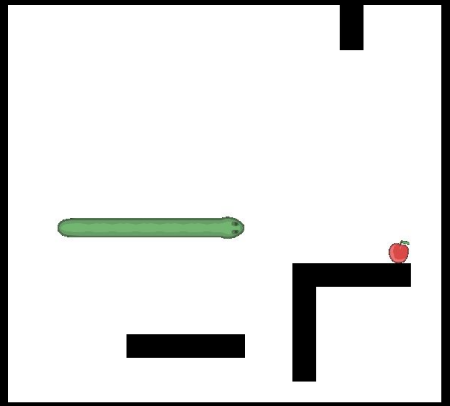
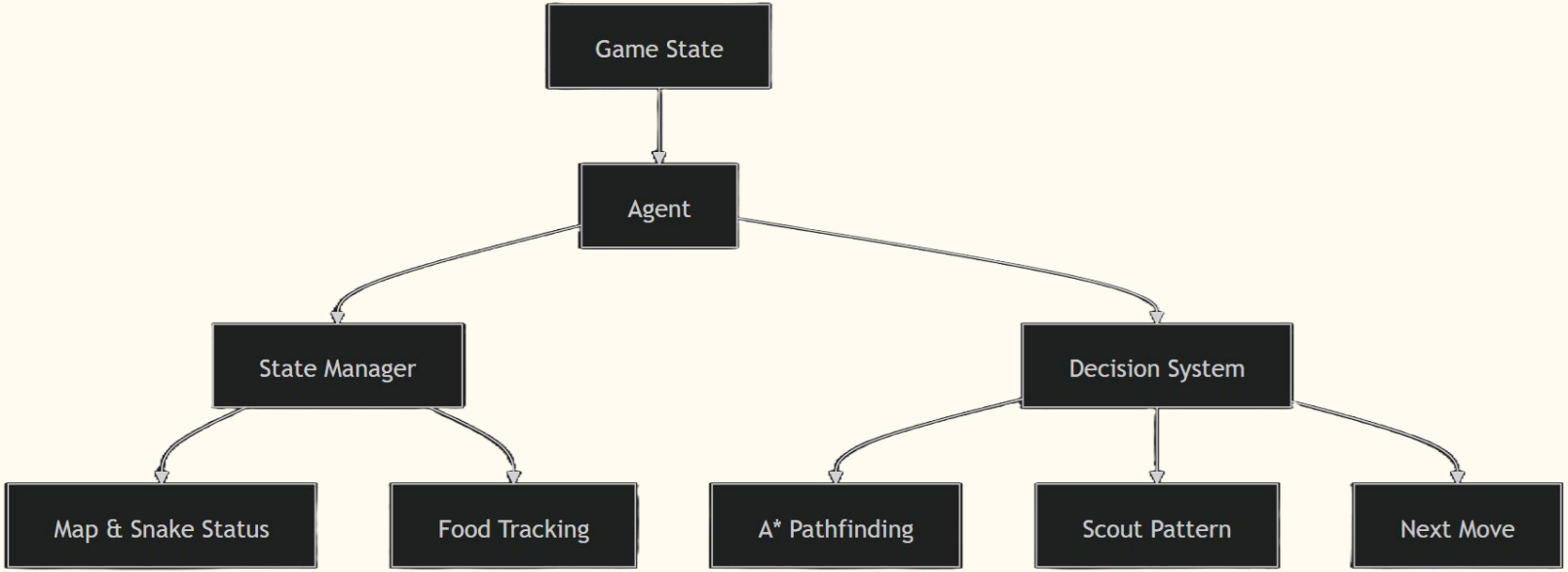
universidade de aveiro

Artificial Intelligence Project: Snake game

73259 | Diogo Gaitas
98543 | Luís Oliveira
102480 | Rúben Pequeno



Agent Architecture



Algorithm Analysis

Key strategies:

- A* pathfinding with Manhattan distance heuristic
- Food (normal or super) prioritization based on game state
- Adaptive scouting patterns (wrap vs. no-wrap)

Strengths:

- Efficient pathfinding
- Robust safety checks

Agent Benchmark

We have runned the program ten times on a VM with limited resources in order to get some feedback of the snake's behaviour.

Results:

- Average score: ~55 points (vs 20-30 in first delivery)
- Survival time: ~1600 steps

LVL	POINTS	STEPS
1	58	1736
2	51	1094
3	55	1171
4	50	1064
5	36	1317
6	75	2346
7	26	843
8	79	3000
9	84	2804
10	42	805
MÉDIA	55.9	1618

Conclusions

Potential Improvements:

- Dynamic risk assessment for superfoods
- Improve super fruit search when “traverse = false”
- Loop avoidance
- Better multiplayer adaptation
- More sophisticated territory control