Traffic Control With AI

Abstract

Inefficient traffic lights may cause congestion, leading to driver stress and economic loss. In this project, we will train AI agents using search algorithms and Q-learning to coordinate traffic.

add results

add discussion

Measuring Default Behavior

We will compare the performance of our agents against the performance of a fixed cycle, namely, switching the direction of traffic flow every 20 units of simulation time. Running 100 iterations of a fixed cycle simulation, we get the following results:

- Average vehicle wait time per episode: 1.81 (seconds or sim units?)
- Average collisions per episode: 0.75

If a collision occurs, the current episode terminates, so a 0.75 collision rate seems high. This stems from the fact that vehicles start moving the moment the light changes to green, even if the junction is not yet empty. In a real situation, drivers know to wait until the junction clears, making the collision rate much lower.