

Final Project Proposal

Choice #3: MDP Simulation

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Description: Our final project will apply the Markov Decision Process to the simulated task of finding a parking spot in a crowded lot. We feel that the MDP is well suited to this application because the spots will have both uncertainty and randomization. The agent's view can be limited to spots within a certain distance from them, and the spots can be randomly filled on each run. Solution policies are straightforward, since the agent must obey both physics and traffic law, for which "driving" only through the aisles or through a "pull-through" spot is a sufficient approximation. The reward function can include more points for parking closer to the goal, or finding a desirable spot such as a 'pull-through'.

Implementations:

Player Agent - Car

Goal - Parking Spots + More points for closer proximity

Adversaries - Other cars looking for parking spots

Uncertainties - Limited Field of View, Other cars might take spots

Randomization - Different spots will be available during each playthrough

Bonus Rewards - Pulling through/Closer to certain exit

Final Format:

Language - Python

GUI - Grid world-style representation of the parking lot, probably rendered by Tkinter.

Host/Environment -:Run locally from the command line; build a web app if possible.