DEEP REINFORCEMENT LEARNING

GITHUB REPOSITORY

For Highway In Mixed Traffic

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Motivation

1. The Rise Of Autonomous Vehicle Industry.
2. Severe Increase in Accidents and Collisions.
    - Leading to Increase Relevant Research
3. Nature of the situation is Autonomous.
    - Makes it a good Reinforcement Learning Problem
4. Vividly Visualizable Environment.
5. 20% Weightage¿?

Problem Statement

Implementation of Highway Navigation is a challenging task for autonomous vehicles (AVs), especially in mixed traffic where AVs coexist with human-driven vehicles (HDVs).

Baseline RL Algorithms Implemented For Highway problem:

1. Deep Q-Network
2. Monte Carlo Tree Search
3. Value Iteration

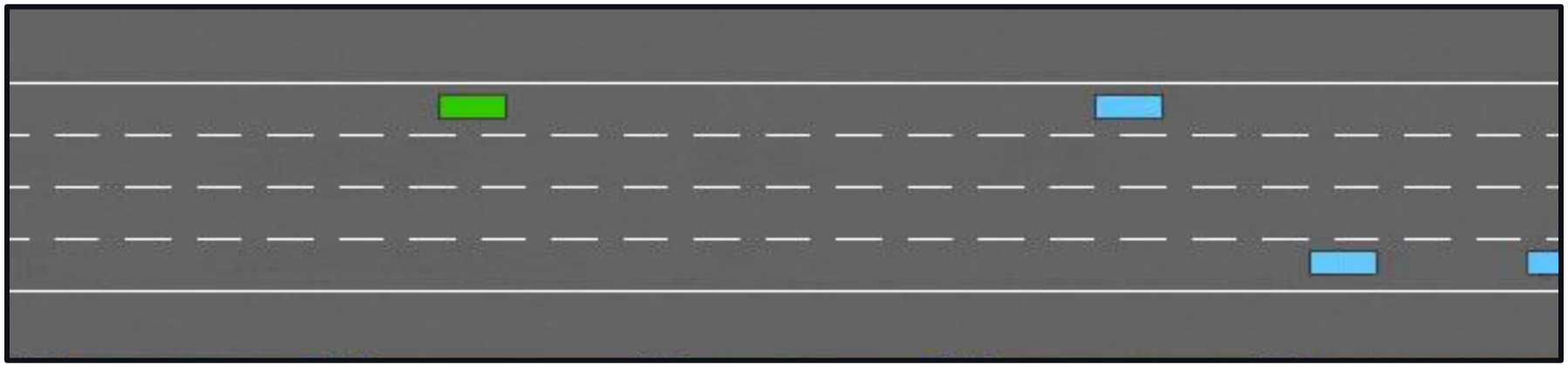
Proposed Algorithms To Be Implemented

In addition to what is covered in the algorithms under the problem statement...

We plan to do the following*:*

1. Value Iteration (After Creating A Finite MDP)
2. Actor Critic Method
3. SARSA
4. Q- Learning

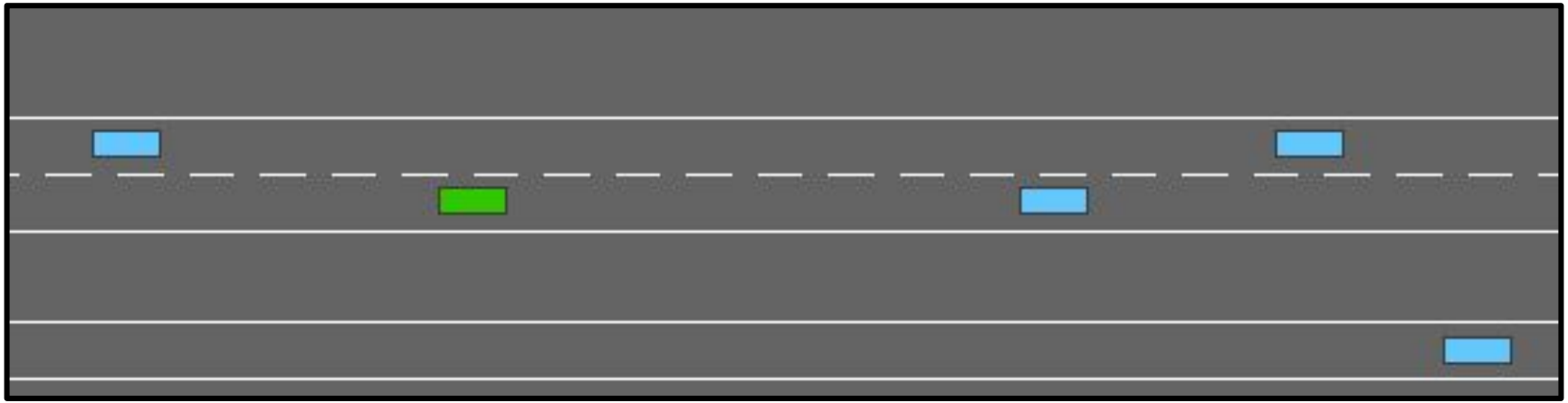
Highway-env



Extended Implementation

1. Multi Agent Systems For Highway Problem:
    - Multi Agent Deep Q Network
2. Merge Problem:
    - Actor Critic Method
    - Proximal Policy Optimization (PPO)
        - Multi-Agent?

Merge-env



Baseline Papers

Highway Problem:

Learning Interaction-aware Guidance Policies for Motion Planning in Dense Traffic Scenarios

Autonomous Highway Driving using Deep Reinforcement Learning

Merge Problem:

Deep Multi-agent Reinforcement Learning for Highway On-Ramp Merging in Mixed Traffic