**Lab 3: DQN for Highway Driving**

This lab is based on highway-env <https://github.com/eleurent/highway-env>. In envs/highway\_env.py, the reward is defined as:

It is rewarded for reaching a high speed, staying on the rightmost lanes and avoiding collisions. Your task is to add an additional term to penalize changing lanes. Please refer to envs/roundabout\_env.py \_reward(self, action: int) for reference.

def \_reward(self, action: int) -> float:

reward = \

+ self.config["collision\_reward"] \* self.vehicle.crashed \

+ self.config["right\_lane\_reward"] \* lane / max(len(neighbours) - 1, 1) \

+ self.config["high\_speed\_reward"] \* np.clip(scaled\_speed, 0, 1)

Steps:

1. Fork the highway-env repository to your own GitHub account, and modify highway\_env.py. (if you are not familiar with GitHub, I recommend installing GitHub Desktop <https://desktop.github.com>.)
2. In Replace

!pip install highway-env

with your own repository:

!pip install git+https://github.com/guzonghua/highway-env