

# 智慧號誌控制方法與評估

## (Evaluation of Intelligent Traffic Signal Control

### Methods)

指導教授：張大偉教授

專題成員：林谷安 蔡承恩 蔡承璋 吳柏霖

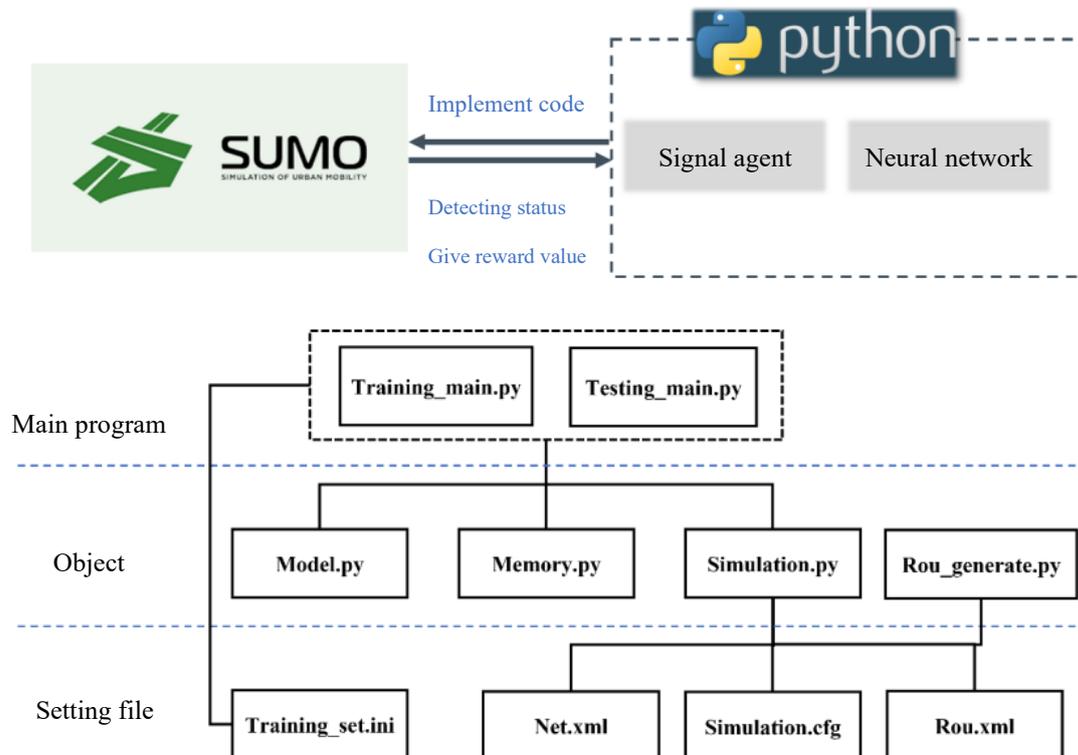
開發工具：python3.9.13

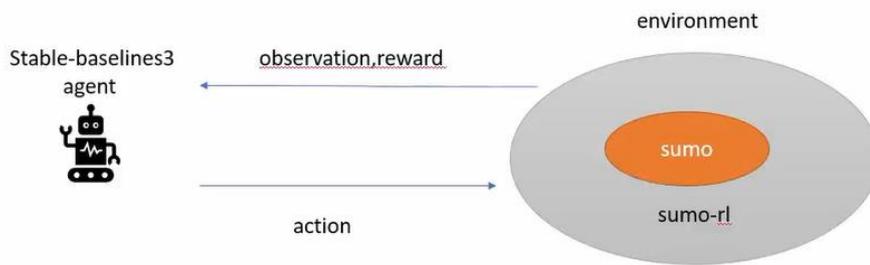
測試環境：pipenv

#### 一、簡介：

To improve the transportation environment, we use both dynamic methods and machine learning to control traffic signal, and evaluate the result respectively. Because there's no properly place to place camera, so we use an open source traffic simulation software called "sumo", which developed by German Aerospace Center Institute of Transportation Systems. Since sumo supports languages like python and c++, we can easily utilize our program to simulate it and estimate the results.

以下為系統架構圖：



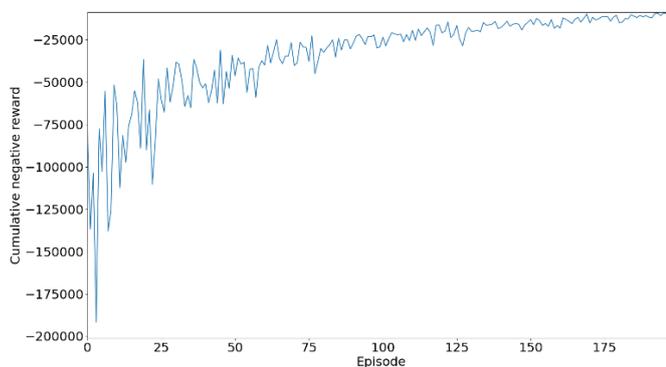


We use the `sumo_rl` package to wrap our environment into a popular gym environment for deep reinforcement learning. With this environment, we test the training results of different algorithms and parameter settings using the `stable-baselines3` deep reinforcement learning library.

## 二、測試結果：

We apply both dynamic and machine learning methods to implement our tasks, and use reward value (old waiting time – current waiting time). That is, higher reward value represents better performance.

### Dynamic's result:



### Machine learning's result:

