

Abstract

This research proposes Traffic Light Control as the main topic. It is a topic which received many attention from the researchers due to its important nature, because it is the most determining factor to traffic optimization. Some basic and advanced algorithms have been devised by researchers to overcome this problem since years ago. Specifically, this research would also does the same, by producing a Traffic Light Control scheme by using a model based Reinforcement Learning which is Markov Decision Process (MDP). This particular MDP model is obtained through observation to the environment which is an infrastructure that comes from a traffic light simulator, Green Light District. This research produces an MDP model that is able to optimize the waiting time of the tested infrastructure. The approach which is used to build the MDP model is by observing the density of each lane that is going inside into a single junction to form the states, while the action is taken from the identifier of a lane which has green as its traffic light's sign within a single junction. Based on the test results, this particular MDP model outperformed the other basic Traffic Light Control algorithms with Average Junction Waiting Time (AJWT) of 29.886 seconds.

Keywords: *Traffic Light Control, Reinforcement Learning, Markov Decision Process, Waiting Time, Green Light District Simulator, Optimization.*