

Q-learning based traffic optimization in management of signal timing plan

Abstract

Occurrences of traffic congestions within the urban traffic network are increasing in a rapid rate due to the rising traffic demands of the outnumbered vehicles on road. The effectiveness of management from traffic signal timing planner is the key solution to solve the traffic congestions, but unfortunately the current traffic light signal system is not fully optimized based on the dynamic traffic conditions on the road. Adaptable traffic signal timing plan system with ability to learn from their past experiences is needed to overcome the dynamic changes of the urban traffic network. The ability of Q-learning to prospect gains from future actions and obtain rewards from its past experiences allows Q-learning to improve its decisions for the best possible actions. A good valuable performance has been shown by the proposed learning algorithm that able to improve the traffic signal timing plan for the dynamic traffic flows within a traffic network.