

Agent-based optimization for Multiple Signalized Intersections using Q-Learning

ABSTRACT

Relieving urban traffic congestion has always been an urgent call in a dynamic traffic network. The objective of this research is to control the traffic flow within a traffic network consists of multiple signalized intersections with traffic ramp. The massive traffic network problem is dealt through Q-learning actuated traffic signalization (QLTS), where the traffic phases will be monitored as immediate actions can be taken during congestion to minimize the number of vehicles in queue. QLTS is tested under two cases and has better performance than common fixed-time traffic signalization (FTS). When dealing with the ramp flow, QLTS has flexibility to change the traffic signals according to the traffic conditions and necessity.