Abstract

This paper depicts using multi-agent reinforcement learning (MARL) algorithm for learning traffic pattern to minimize the traveling time or maximizing safety and optimizing traffic pattern (OTP). This model provides a description and solution to optimize traffic pattern that use multi-agent based reinforcement learning algorithms. MARL uses multi-agent structure where vehicles and traffic signals are working as agents. In this model traffic area divide in different different traffic ZONE. Each zone have own distributed agent and these agent will pass the information one zone to other throw the network. The Optimization objectives include the number of vehicle stops, the average waiting time and maximum queue length of the next (node) intersection. In addition, this research also introduce the priority control of buses and emergent vehicles into this model. Expected outcome of the algorithm is comparable to the performance of Q-Learning and Temporal difference learning. The results show significant reduction in waiting time comparable to those algorithms for the work more efficiently than other traffic system.


**Index Terms**

Computer Science  Automation
Improved Multi-Agent Reinforcement Learning for Minimizing Traffic Waiting Time

Keywords
Agent Based System  Intelligent Traffic Signal Control  Multi Objective Scheme
Optimization Objectives

RL

Multi-Agent System (MAS).