عنوان مقاله:

Multi-agent Reinforcement Learning for Integrated Network ofAdaptive Traffic Signal Controllers (MARLIN-ATSC):Potential Applications in Tehran

محل انتشار:

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خلاصه مقاله:

In this paper, we highlight the state-of-the-art and state-of-the-practice inAdaptive Traffic Signal Control (ATSC) and their limitations, particularly in thecontext of large Iranian cities and urban areas. We also introduce the latest ATSCsystem, MARLIN-ATSC, from the University of Toronto's ITS Centre and Testbedand also demonstrate its performance on a micro-simulation which has beentested of a large-scale of an urban network of 59 intersections in downtownToronto. the results are presented based on the control systems and MARLINIndependent and Integrated Modes. Results showed that MARLIN significantlyoutperformed the BC in all the MOEs including intersection delay, fuelconsumption and emissions. In terms of route travel time, it was generally foundthat MARLIN exhibited less average route travel time and less variation of thetemporal distribution across the simulation hour compared to the other scenarios.We conclude with our vision for assessing the potential testing and application ofMARLIN-ATSC in Tehran and present a high level plan forward starting from apilot study to full implementation of the system if results from the pilot study arefavourable.

کلمات کلیدی:

Adaptive traffic signal control, micro-simulation modeling, multi-agentreinforcement learning