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SELF-ADAPTING REWARD-BASED REINFORCEMENT LEARNING FOR OPTIMIZING TRAFFIC SIGNALS WITH AN SUMO-BASED DIGITAL TWIN IN SMART CITY TRAFFIC CONTROL

NILANJAN DAS*

As the traffic complexities and issues increases in smart intelligent cities, intelligent smart adaptive management and controlling mechanism is in highly priority. A proposed framework of real-time traffic digital twin using Simulation of Urban Mobility (SUMO) with TraCI, and Python-based reinforcement learning to optimize traffic flow has been incorporated in this paper. In this paper, proposed framework of digital twin captured real-time traffic data including, waiting time, and queue length and CO2 emission using reinforcement learning with Genetic Algorithm dynamically control the traffic signal to reduce the congestion and traffic delay. This paper incorporate a Genetic algorithm based hybrid Reinforcement Learning framework to reduce the congestion and CO2 emission by optimizing traffic signal dynamically.