

عنوان مقاله:

Fuzzy Q-Learning Traffic Light Control based on Traffic Flow and Pedestrian Number Estimated from Visual Information

محل انتشار:

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خلاصه مقاله:

A vision-based intelligent traffic control system is a robust framework that controls the traffic flow in real-time by estimating the traffic density near traffic lights. In this paper, a traffic light control system based on fuzzy Q-learning is proposed according to the vehicle density and the pedestrian number estimated from the visual information. The aim of the proposed approach is to minimize the pedestrian and the car waiting time and maximize throughput for an isolated 4-way traffic intersection. Also, the pedestrian traffic light is controlled based on the fuzzy logic. The states and actions of the Q-learning variables are set by a fuzzy algorithm which can be learned through environmental interactions. The system can detect the number of pedestrians and vehicles using visual information from cameras and machine vision algorithms. The fuzzy control system can adjust the sequence of green phases to decrease the total waiting time and the mean of the queue length. The proposed algorithm was simulated for one hour for each of 14 different traffic conditions and was assessed and compared with the preset cycle time and vehicle actuated approaches. The results showed the proposed algorithm could decrease the total waiting time and the mean of the queue length effectively.

کلمات کلیدی:

Intelligent traffic control system, Traffic density, Fuzzy logic, traffic light control

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