Traffic Light Control System using Genetic Algorithm

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Abstract

Genetic Algorithm (GA) technology in the traffic control system to provide intelligent green interval responses based on dynamic traffic load inputs, thereby overcoming the inefficiencies of the conventional fixed traffic controllers.

In this paper, the authors explore the use of genetic algorithm and implementing the technology to improve the performance of traffic light and Road control in a four-way, two-lane traffic. The algorithm resolves the limitations of traditional fixed-time control for passing vehicles. It employs a dynamic system to control the traffic light system that monitors two sets of parameters: the vehicle and upstream and downstream lane queues behind a red light and the number of vehicles that passes through a green light. The algorithm dynamically optimizes the red and green times to control the flow of the vehicles. Performance comparisons between the Dynamic traffic controller and a fixed-time controller reveal that the genetic algorithm controller performs significantly better. The authors compare the performance of their algorithm with the unimproved one for different simulated data. Results show that, the algorithm increases the
traffic efficiency and decreases the waiting delay by 30 minute compared with the unimproved one.

References


Index Terms

Computer Science Algorithms
Keywords

Genetic Algorithm, Traffic Control System, Traffic Light, Optimization.