先端科学技術研究科 修士論文要旨

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In today's highly developed transportation systems, the condition for the fastest arrival of a vehicle at its destination can be attained when the vehicle maintains its maximum speed throughout the entire journey. However, in real life, there are many factors that prevent vehicles from reaching their destinations in the shortest possible time. The most typical of such cases is traffic congestion, waiting at intersections and traffic accidents. Many researchers have used neural networks, genetic algorithms, fuzzy logic and back pressure to control the waiting time of vehicles at intersections and reduce the average vehicle waiting time. Most of these studies focus on vehicle queues or vehicles themselves. The pedestrians as road users also affect the vehicles' passage at the intersection.

This study investigates the impact of pedestrians and their number on vehicle throughput at intersections, as well as the impact of different numbers of pedestrians on the respective vehicle throughput times in different traffic signal systems. It also proposes a method to switch the traffic signal control system based on the number of pedestrians at the intersection to reduce the impact of pedestrian crossing on vehicle traffic, thus reducing the average waiting time for vehicles to reach their destinations faster.