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Ant pheromone route guidance strategy in intelligent transportation systems

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Abstract

Based on the cellular automaton model and the concept of ant pheromone, this paper proposes a new route guidance strategy, called the ant pheromone route guidance strategy, in which the vehicles are regarded as special types of ants and their traffic information is regarded as the ant pheromone. To evaluate its performance, the new route guidance strategy was applied and compared with other three typical route guidance strategies under three different route scenarios, respectively, with open boundary conditions based on the Nagel–Schreckenberg cellular automaton model. First, in a symmetrical two-route scenario with two exits, results showed that the new route guidance strategy and vacancy length route guidance strategy were optimal. They outperformed the other strategies in terms of the value, stability, and balance of vehicle number, and the average speed and average flux on each route. To understand the impact of the strategy on traffic states, flux-density

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