

基于多智能体的交通信号控制与路径诱导的协同

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摘要 在总结已有交通信号控制与路径诱导协同模型的基础上, 分析了路段行程时间函数与信号控制策略对协同模型求解唯一性与收敛性的影响; 设计了交通信号控制与路径诱导协同研究的多智能体模拟系统。该系统由交叉口控制智能体、路径诱导智能体、信息处理智能体组成, 具有较大的灵活性与可扩展性。该模拟系统中路径诱导策略是用户最优策略, 交通流动力学由元胞传输模型描述, 信号配时由基于元胞的交通控制模型优化。模拟结果表明, 实施交通信号控制与路径诱导协同后, 路网总行程时间最多可减少41.4%。

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Synergy of traffic signal control and route guidance based on multi agent system

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Abstract Based on the summarization of the existing synergy models of the traffic signal control and the route guidance, the impacts of the road section travel time function and the traffic signal control strategy on the solution uniqueness and convergence of the synergy model were analyzed. A multi agent simulation system was established for the synergy study of the traffic signal control and the route guidance. The system is consisted of a road intersection control agent, a route guidance agent and an information processing agent, being characterized by the flexibility and expansibility. In the simulation system, the route guidance strategy is the user optimizing strategy, the traffic flow dynamics is described by the cell transmission model, and the traffic signal plan is optimized by the cell based traffic control model. The simulation results are encouraging and the synergy of the traffic signal control and the route guidance leads to saving in the total travel time up to 41.4%.

Key words [engineering of communication and transportation system](#) [traffic control](#) [traffic guidance](#) [multi agent system](#) [re distribution of traffic flow](#)

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