

Data-driven Traffic Network Optimization and Control

Aim and Scope:

With the development and application of intelligent vehicle technology and network communication technology, more comprehensive information can be obtained such as vehicle trajectories, and more advanced traffic control can be realized with these information. This brought new challenges to the modeling, optimization and control of traffic networks. Therefore, it is necessary to collect the multi-source information from intelligent vehicle networks, and to explore the application of these information, so as to optimize the network travel efficiency through multiple measures for intelligent vehicle and traffic networks, such as vehicle trajectory optimizations, network throughput optimizations, and their combinations. For the traditional traffic network control, traffic network dynamic models described by a certain detail of accuracy are established for road networks, and then strategies with different structures are designed to optimize and control road networks based on these models. In the new situation, the traditional model-based strategies are not sufficient enough for optimizing and controlling the traffic networks, because the traffic information that can be collected from the traffic networks differs a lot from that of before. To make full use of these information and to design more advanced traffic network controller, data-driven traffic network optimization and control algorithms are needed to be investigated. However, when design data-driven traffic network optimization and control methods, how to make use of the previous research results on the model-based optimization control, is still an open issue that need to be investigated. In the special session, the main topic is the modeling, prediction, optimization, and control algorithms for traffic networks with intelligent vehicles.

List of specific topics of interest:

1. Vehicle trajectory-based prediction for travel time, traffic demand, route choice
2. Vehicle trajectory prediction and optimization in traffic networks
3. Traffic network optimization
4. Traffic network control
5. Data-driven traffic network control
6. Iterative traffic network control
7. Multi-level traffic network optimization and control
8. Integrated optimization and control for route choice and network throughput

Expected number of manuscripts submitted for consideration 6

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