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Detailed Table of Contents

Providing services and infrastructure for autonomous vehicles at intersections is also the topic of this chapter in which the authors describe an agent-based valuation-aware traffic control system for intersections. Their approach combines valuation-aware intersection-control mechanisms with driver-assistance features such as adaptive cruise and crossing control.

Collaborative driving is the focus of this chapter. The authors describe an agent-based cooperative architecture that aims at controlling and coordinating vehicles, also showing that reinforcement learning can be used for this purpose.

The authors of this chapter tackle the issue of how road users can learn to coordinate their actions with those of other agents in a scenario without communication. Further, the authors explore the impacts of agent reward functions on two traffic related problems (selection of departure time and selection of lane).

In this chapter, the authors discuss multiagent learning in the context of a coordination mechanism where teams of agents coordinate their velocities when approaching the intersection in a decentralized way, improving the intersection efficiency.

The authors of this chapter propose a cooperative car navigation system with route information sharing, based on multi-agent simulation. They use a scenario from Tokyo in which drivers can share information about their route choices. Results have confirmed that the mechanism has reduced the average travel time of drivers sharing information and that the network structure influenced the effectiveness of the mechanism.

Exchange of information is also tackled in this chapter, this time by traffic signal agents. Authors show that these agents can learn better than independent ones, by sharing information about their environment.

Section III
Logistics and Air Traffic Management

In this chapter, the authors apply agent-based solutions to handle job arrival uncertainty in a real-world scenario. This approach is compared to an on-line optimization approach across four scenarios, with the results indicating that the agent-based approach is competitive.

This chapter deals with the use of agent-based simulation for modelling the organisational structure and mechanisms in the context of regional transport corridors. A special focus is put on the accurate conceptualization of costs.