

Distributed Multi-Agent Based Approach on Intelligent Transportation Network

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Abstract : With the accelerating process of urbanization, the problem of urban road congestion is becoming more and more serious. Intelligent transportation system combining distributed and artificial intelligence has become a research hotspot. As the core development direction of the intelligent transportation system, Cooperative Intelligent Transportation System (C-ITS) integrates advanced information technology and communication methods and realizes the integration of humans, vehicle, roadside infrastructure, and other elements through the multi-agent distributed system. By analyzing the system architecture and technical characteristics of C-ITS, the report proposes a distributed multi-agent C-ITS. The system consists of Roadside Sub-system, Vehicle Sub-system, and Personal Sub-system. At the same time, we explore the scalability of the C-ITS and put forward incorporating local rewards in the centralized training decentralized execution paradigm, hoping to add a scalable value decomposition method. In addition, we also suggest introducing blockchain to improve the safety of the traffic information transmission process. The system is expected to improve vehicle capacity and traffic safety.

Keywords : distributed system, artificial intelligence, multi-agent, cooperative intelligent transportation system

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