

A Survey on Intelligent Traffic Management with Cooperative Driving in Urban Roads

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Abstract : Traffic management and traffic planning are important issues, especially in big cities. Due to the increase of personal vehicles and the physical constraints of urban roads, the problem of transportation especially in crowded cities over time is revealed. This situation reduces the living standards, and it can put human life at risk because the vehicles such as ambulance, fire department are prevented from reaching their targets. Even if the city planners take these problems into account, emergency planning and traffic management are needed to avoid cases such as traffic congestion, intersections, traffic jams caused by traffic accidents or roadworks. In this study, in smart traffic management issues, proposed solutions using intelligent vehicles acting in cooperation with urban roads are examined. Traffic management is becoming more difficult due to factors such as fatigue, carelessness, sleeplessness, social behavior patterns, and lack of education. However, autonomous vehicles, which remove the problems caused by human weaknesses by providing driving control, are increasing the success of practicing the algorithms developed in city traffic management. Such intelligent vehicles have become an important solution in urban life by using 'swarm intelligence' algorithms and cooperative driving methods to provide traffic flow, prevent traffic accidents, and increase living standards. In this study, studies conducted in this area have been dealt with in terms of traffic jam, intersections, regulation of traffic flow, signaling, prevention of traffic accidents, cooperation and communication techniques of vehicles, fleet management, transportation of emergency vehicles. From these concepts, some taxonomies were made out of the way. This work helps to develop new solutions and algorithms for cities where intelligent vehicles that can perform cooperative driving can take place, and at the same time emphasize the trend in this area.

Keywords : intelligent traffic management, cooperative driving, smart driving, urban road, swarm intelligence, connected vehicles

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