

VANETs overview, advanced traffic light control

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Abstract

In present time the research of Vehicular Ad Hoc Networks is very actual. This paradigm can be used for purposes such as traffic safety, crash avoidance, routing planning, Internet access, etc. The main problems in this area are security of the VANETs, topology and data routing, data delivery and communication protocols, routing planning and its privacy. Several routing methods are used in VANETs, such as Live traffic map, Route Information sharing, Shortest Path, etc. Efficiency of these methods was compared using SUMO traffic simulator. To estimate the efficiency of the observed methods the following criteria are used: total travel time, waiting time. For the optimisation of routing planning a central server is required. There are several problems in this area, such as actual topology of the network, the load balancing and reduction of the central server.

Very important aspect of using VANETs is security and privacy. We need to provide secure data exchange between traffic participants and the central server. We should also enable route sharing without breaking privacy of drivers.

In this paper we will focus on the advanced controlling of traffic lights using VANETs. The different situations were simulated on SUMO traffic simulator: simple traffic light, traffic light with separate light for turning, traffic light connected to VANET. There are two kinds of information which are shared in VANETs - position sharing and route sharing. We simulated and compared these two cases in different circumstances.

Keywords: VANET, Traffic control, route sharing, live traffic map, advanced traffic lights, SUMO