An enhanced AODV protocol for external communication in self-driving vehicles

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Abstract:

The increasing number of autonomous and semi-autonomous vehicles on the road leads to an increasing need for external vehicle communication, in particular through emerging vehicular ad hoc networks also known as VANETs. This technology has the ability to facilitate intelligent transportation applications, comfort and other required services for self-driving vehicles. However, suitable routing protocols need to be utilised in order to provide stable routing and enable high performance for this external communication in autonomous vehicles. Ad hoc on Demand Distance Vector routing (AODV) is to date rarely used in mobile ad hoc network but offers great potential as a reactive routing protocol. However, the AODV protocol is affected by poor performance, when directly employed in VANETs. In this paper, two improvements are presented to the route selection and route discovery of AODV to improve its performance in forms of packet delivery rate and communication link stability for VANETs. Thus, we obtain new vehicle V-AODV that suits the specific requirements of autonomous vehicles communications. Simulation results demonstrate that V-AODV can enhance the route stability, reduce overhead and improve communication performance between vehicles.

Keywords

- [Routing protocols](),
- [Ad hoc networks](),
- [Autonomous vehicles](),
- [Routing](),
- [Mobile computing](),
- [Mobile nodes]()