

Collision avoidance in Vehicular Networks using V2V-V2R communication

Group No: 5

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Abstract

Intersection in Urban areas contribute to 26% of Collisions in United States. Majority of the accidents occur due to traffic signal violation at Intersections. The data for collision avoidance being critical should be delivered real time and should guarantee end to end packet transmission. The existing approaches talk about wireless sensor networks(WSN) on the roads which supply information to the Base station about collision detection, some approaches talk about radar for sensing vehicles, vehicle to vehicle co-operative mechanisms. These approaches mainly lack important property of either scalability or reliability or both.

We are proposing a complete V2V-V2R model based Architecture which addresses the issues mentioned above by designing a decentralized and Dedicated Short Range Communication(DSRC) based system to fulfill the requirements of effective Collision Avoidance system. The system consists of a multichannel environment that has a dedicated Control channel for Safely sending the Alert messages to the Vehicles. The System will have an On board unit in the vehicle which will communicate its location and velocity information to the Road side unit. The vehicular networks use GPS mechanisms for these purposes. The system also overcomes the effect of Shadowing by having the piggybacking mechanism in RSU frames. The Vehicle stores the RSU frames and then communicates that information to other vehicles. As compared to the previous works of measuring the impact of deploying RSUs at Highway junctions, the aim of our project is mainly to evaluate the Architecture by considering the complications of the dense traffic in the Urban scenario.

Future Work

If possible we will try to evaluate the metrics in the presence of Obstructions.

As there are not much Vehicular traces available, we will be simulating basic scenarios like 2 road intersecting at junction with fixed number of vehicles passing by, using VanetMobisim simulator and further investigations will be done using NS-2.

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