

Enhanced multi-hop mechanism in vehicular communication system using swarm algorithm

ABSTRACT

As on-road vehicles are increasing every year, safety on the road has become one of the major concerns. Therefore, Vehicular Ad Hoc Network (VANET) becomes as an important role on the road. In VANET, communication occurs between vehicles and the infrastructures. During broadcasting, an emergency message is transferred to the surrounding vehicles to alert other vehicles in the area. However, blind flooding in wireless network might result in redundant rebroadcast, contentions and collision with the neighbouring nodes. This situation is named as broadcast storm. Broadcast storm might lead to the losses of the information or lead to the wrong information being transmitted to the neighbouring nodes. The paper aims to design a broadcast control system which is able to optimize the broadcast process in VANET. Vehicular network is modelled in Simulation of Urban Mobility (SUMO) and the algorithm is formulated in MATLAB. Data is extracted from SUMO through Traffic Control Interface for MATLAB (TraCI4Matlab). The broadcast protocol and Particle Swarm Optimization (PSO) algorithm are formulated in this paper. At the same time PSO is modified for the broadcast enhancement. Results showed that after parameters tuning the modified PSO is able to broadcast into a larger coverage area at a faster rate.