

Implementation of V2V and V2R Communications for VANET Routing Protocol

Pramod Mutalik
Asst. Professor Dept. of ECE BITM, Ballari

Dr. Venkangouda C Patil
Professor & Principal

Abstract— Vehicular communication is defined as communication between the vehicles. The main objective of deploying VANET is to reduce the number of accidents at particular urban area at high level. It has a great effect on passenger's safety and for drivers to drive smoothly in the urban area. As vehicles population increases day by day the rate of accidents also increases, therefore it is necessary for the vehicles to communicate [2]. According to the World Health Organization (WHO) the Road-Traffic Injuries statistics of all countries show that after 2000, road accident is a major cause of death [3]. Hence, there must be a better traffic system to solve this problem. VANET is such an advanced network which mainly provides Intelligent Transportation System (ITS) services to the end users for providing fast data exchanges and safety.

Keywords— Vehicle to vehicle (V2V), RSU, intelligent transportation systems (ITS), and routing protocols.

INTRODUCTION

The use of Ad-hoc network technology in monitoring the traffic control management and finding quality of traffic control management gives the analytical methods on the quantitative and qualitative measures in collecting the functional requirements. The communication in VANET occurs between Vehicle 2 Vehicle mode and Vehicle to road side unit forming an intelligent transport system. Routing plays an important role in forwarding the required data to the nodes or vehicles. VANETs interface the few aspects of ad hoc networks, wireless and cellular technology to form an intelligent transport systems by communicating between vehicle to vehicle and vehicle to road side units. The present day vehicular technology uses The IEEE standard of 802.11 amends the IEEE 802.11p for wireless access in vehicular environments which uses 5.9Ghz, a licensed ITS band for communication between vehicles and road side units.[4][5][6]. The main goal of VANET is to provide safety and security for citizens communicating with the drivers on the roads by informing about accidents or uncertainty conditions and traffic data. Each node or the vehicle is equipped with VANET device to form an Adhoc network instantaneously and can able to receive and broadcast the required messages through wireless network. The advantages of VANET are the safety driving, collision warning and exchanging of life critical warning messages using intelligent transport system equipped in vehicle which will make the driver aware of the situation and be safe[7].

PORPOSED MODEL

The main goal of research is to reduce the inconsistencies existing in the current system. For this we use a Vehicular Ad-Hoc Network, or VANET which is a technology that uses moving vehicles as nodes in a network to create a mobile network. VANET turns every participating vehicle into a wireless router or node, allowing vehicles approximately 100 to 300 meters of each other to connect and, in turn, create a network with a wide range. VANET can be used to build simulative models of various VANET system test-cases that are generally built using network simulators without proper GUI support. MATLAB offers rich set of functionalities which reduces the development time for the framework necessary for carrying out tests. The flowchart we will explain that creating nodes and road side unit and afterwards establish connection between each node and RSU unit and finally measures the wait time and speed of the overall system. Hence proposed model gives better performance in terms of speed and wait time state.

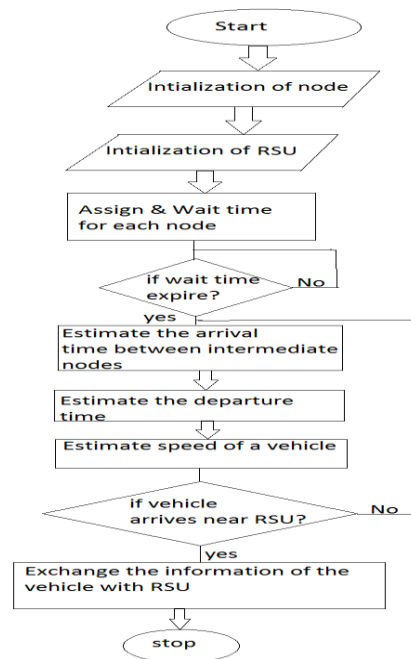


Fig.2.1. Flowchart for customizing the probabilities in VANET

The flowchart provides the interim solution for the above-said problems. Once the node and the roadside unit are initialized to assign the waiting time. Once assigned, estimate the arrival time between intermediate nodes when the waiting time is not expired. If the waiting time is expired go back and reassign the

same. Meanwhile estimate the departure time and speed of the vehicle nearer to the roadside unit, if nearer broadcast the message to the driver using the roadside unit so that the driver gets sufficient time for perceiving and react. Practically these above problems can be achieved by using the proposed protocols of the VANET.

RESULTS AND DISCUSSIONS

In this section we are discussing about Wait time and speed with respect to creation of node and RSU.

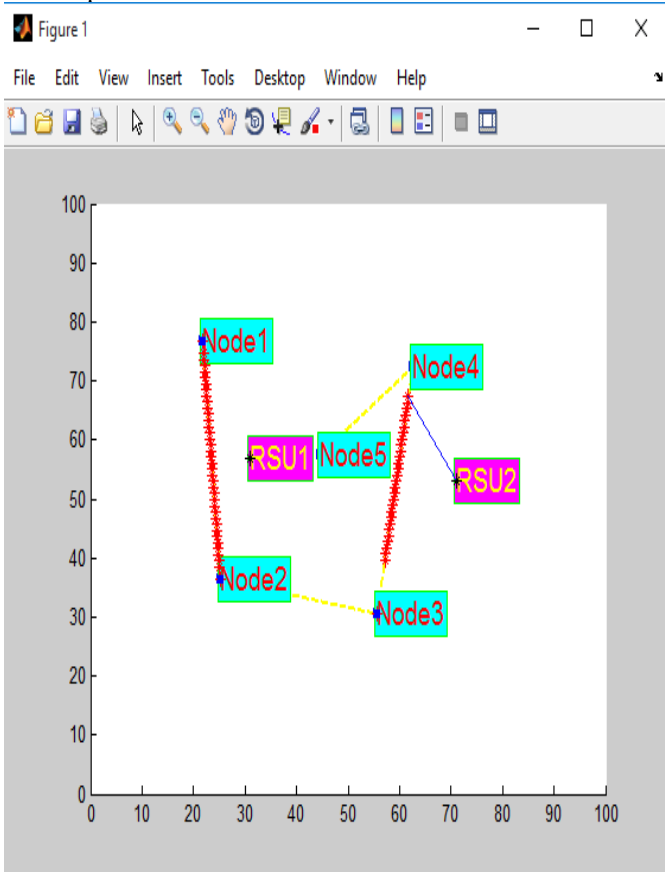


Fig. 3.1. Node and RSU unit Creation

The above figure results the creation of nodes and RSU units and also explains about the communication between two nodes and nodes with RSU units. The communication between two nodes gives the information about time and speed. In intermediated nodes it will give the wait time at each node. And finally it gives the arrival and departure time of each node. The RSU unit will only communicate when the nodes are within the region, if nodes are not in the region then RSU unit will nor communicate with the nodes. In the above diagram clear it shows that node 1 and 2 are in within region of RSU 1 unit that is indicated with red lines and other nodes are not in the region hence there is no communication.

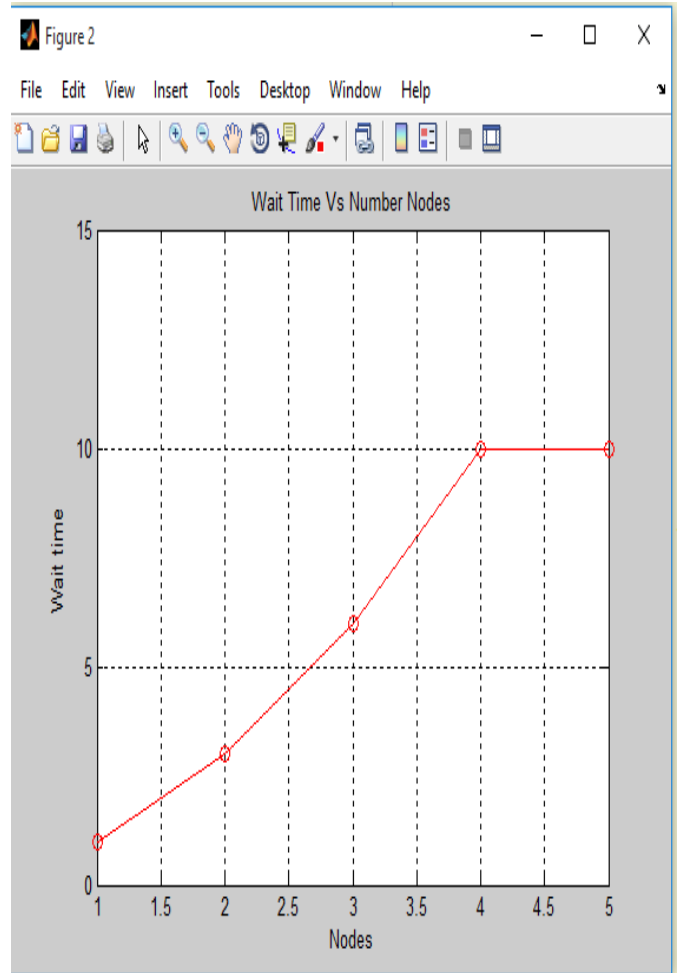


Fig. 3.2 Node vs Wait time

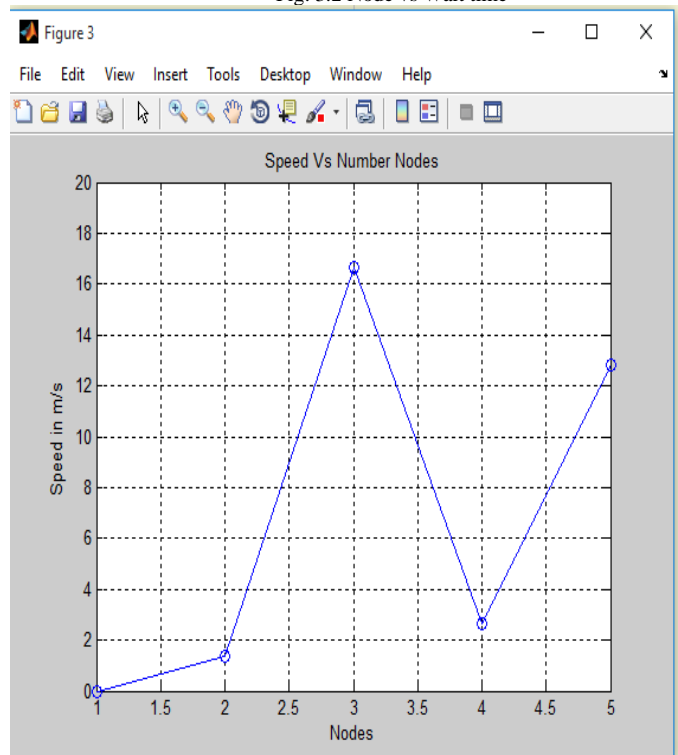


Fig. 3.3. Nodes Vs speed

AUTHORS

Pramod Mutalik- He completed B.E degree in Electronics and Communication engineering 2011. His research focuses on Intelligent Transportation System (ITS), Vehicular Ad-Hoc Network (VANET) and Vehicle to Vehicle (V2V).

Dr. Venkangouda C Patil His research focuses on signal and multimedia processing, communication, Intelligent Transportation System (ITS) and Internet of Things (IoT).

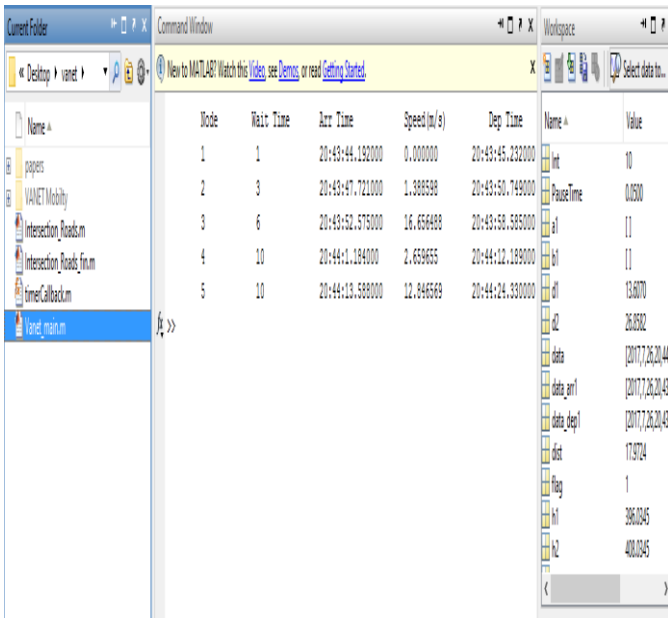


Fig. 3.4. Speed and time estimation result

CONCLUSION

In this paper, we carried out the discussions about creation of node and RSU sides and calculated wait time in each node and plotted the graph between node Vs wait time, Nodes Vs speed and measured the total speed from the source node to destination node.

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