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SOLUTION FOR TRAFFIC CONGESTION TO PREVENT ACCIDENTS INVEHICULAR AD-HOC NETWORK

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Abstract:

Vehicular adhoc networkis a part of mobile ad hoc network which is unstructured formation wirelessnetwork for the transmission of data to field vehicles. In existing system , the last few years ago the invention of mobile networks given a new experience to drive the vehicle on roads high ways by reducing risk of accidents and also road accidents and traffic congestion increasesa number of technical challenges such as improving VANET connectivity and current application in the network of vehicular ad hoc network . In proposed system to improve connectivity betweenvehicle to vehicle as long as they are connected with urban areas andhighways to reducing the road accidents by applying to corresponding nodes which are connected vehicle network and vehicle to vehicle infrastructure. To enhance VANET connectivity with the help of some different paths, with the help of some different simulation, The Project analyzed number of parametersincluding vehicle density, message delay and RSU communication. The different protocols to avoid hidden node problems. The communication is fast moving between two nodes the message transferred to another vehicle without delay and receiver responds immediately, in this hidden node problem is decreased for simulation purpose use interface with NETSIM.

Keywords— VANET, MANET SUMO, NETSIM.

In recent times, the use of Vehicular Ad Hoc Networks (VANETs) for safe driving support systems is gaining attention. Using VANETs, vehicles canconfigure the network and communicate with each other without infrastructure support. Using the aforementioned vehicle-to-vehicle communication effectively, road traffic safety and transportation efficiency can be improved. For example, in the Cooperative Collision Warning (CCW) application, periodic information exchange among vehicles, such as their location and speed, is used bya decision making module to assess possible accident situations and warn drivers about these in advance. Similarly, in the case of Congested Road Notification(CRN) applications, vehicles can alertvehicles and road-side units in other regions about road congestion to allow for route and trip planning ensuring acomfortable drive.

Many VANET applications use broadcast communications to transmit information to surrounding vehicles in the network. Further, when a vehiclebroadcasts a message, the surrounding vehicles that receive the message mightattempt to relay the message further byrebroadcasting it. Although broadcasting isan effective way to disseminate data to a large number of vehicles, it can lead tosome problems in certain situations. Forexample, when all vehicles in a high vehicle density area broadcast simultaneously, a large number of broadcast transmissions are generated, which

devices can strongly compensate for the restricted view field of the driver, and this can lead to lesser accidents caused because of the driver'slimited view. Furthermore, at a crowded intersection or a narrow road with an unclear path, it is difficult to detect surrounding vehicles using only on-vehiclesensors and cameras.

II. RELATED WORK

The VANET topology changes rapidly because of the high mobility of vehicles, which serve as network nodes. To support highspeed and reliable communication, VANETs need quick delivery of packets while covering a wide transmission range. For this reason, broadcasting is an effective approach to disseminate information in VANETs. A variety of broadcasting algorithms exist, such as probability based, location based, and cluster based algorithms. A Decision Making Module for Cooperative Collision Warning Systems Using Vehicular Ad-Hoc Networks(VANET) communication for cooperative collision warning system can increase safety, convenience and efficiency in driving. Intelligent vehicles can collect information about the driving environment, thedriver situation and more importantly other vehicles' information using wireless communication. However, deciding what data to considered, what data to ignore and if and what action should be taken in different situations is a significant issue. In this work,we explore the use of a decision making module for accident situations which processes information from VANET communication and advises the driver based on the situation.

Our decision making algorithm is a simpleand effective algorithm that can be implement in each vehicle to assist the driver in certain situations. Rerouting to avoid traffic congestion caused by the accident is the major part of our decision making algorithm. This module has been implemented and evaluated using the Veins simulation. Towards Characterizing and Classifying Communication-based AutomotiveApplications from a Wireless Networking Perspective Together, the Dedicated Short Range Communication (DSRC) and Vehicular Ad Hoc Network (VANET) technologies provide a unique opportunity to develop various types of communication-based automotive applications. To date, many applications have been identified by the automotive community.

Given the large number and diverse nature of these applications, it is advantageous to develop a systematic classification methodology to facilitate future DSRC and VANET research. Toward this objective, we present a study that goes through two major steps: characterization and classification. First,we focus on a rich set of representative applications and characterize them withrespect to plausible application- and networking-related attributes. The characterization process not only strengthens our understanding of the applications but also sets the stage for the classification step since it reveals numerousapplication commonalities.

III. PROBLEM STATEMENT

In existing work cannot detect hidden vehicles, e.g., vehicles behind othervehicles or structures, which can pose an added risk. In this section, we propose the vehicle visualization system that displays surrounding vehicles on a map on an iOS device, including those hidden by other vehicles or building features. The purpose of this system is to complement the driver's view field and extend the visual range of the driver with respect to approaching vehicles. Limitations of work is as follows: The vehicle visualization system and describe the optimization mechanism used in the system. we present the results of the evaluation of our proposed system we provide concluding remarks for our study.

Proposed Work

The proposed work is intended to support safe driving by displaying the surrounding vehicles on a map on an ios device. In addition, this system implements an optimized mechanism to reduce broadcast packets used for vehicle visualization. We evaluate the proposed system using a real-world VANET experiment. This is structured as follows, we introduce some of the broadcast algorithms used in VANETs. In we propose the vehicle visualization system and describe the optimization mechanism used in the system. In Section IV, we present the results of the evaluation of our proposed system.

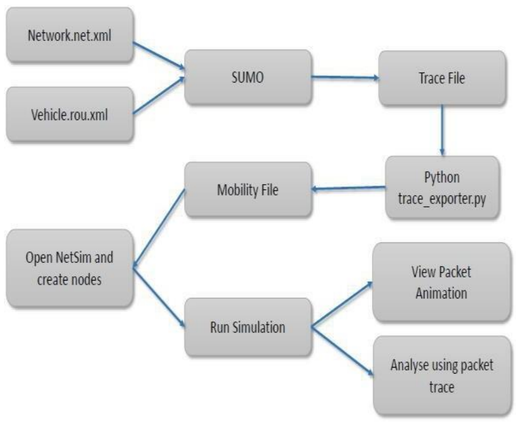
- We discussed the advantage of the cancellation mechanism in. we discuss the negative impact of the cancellation mechanism.
- To evaluate the negative impact, we investigate the importance of canceled location information

IV PERFORMANCE TECHNIQUE

- Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
- Provide extendibility and specialization mechanisms to extend the core concepts.
- Be independent particular programminglanguages and development process.
- Provide a formal basis for understandingthe modeling language.
- Encourage the growth OO tools market.
- Support high level development concepts such a collaborations, frameworks, patternsand components.
- Integrate best practices.

V PERFORMNACE TECHNIQUE

Its purpose is to present a graphical overview of the functionality provided bya system in terms of actors, their goals(represented as use cases), and any dependencies between those use cases. Themain purpose of a use case diagram is to show what system functions are performed for which actor.



Roles of the actors in the system can be depicted.

Fig (1): SUMO-NETSIM- INTERFACING

SUMO file is a combination of Edge and node file, network file vehicles route file SUMO configured file is called a mobility file. Final mobility file of SUMO is given input for NETSIM. NETSIM Simulate Result with help of SUMO mobility file

I. SUMO
II. NETEDIT
III. NETSIM

I. SUMO – Basically it is an open- source software for traffic simulation. Thisparticular sumo helps in the controlling of the traffic simulation and it provides easement to the command of the certain routes and the departure times of vehicles. By the help of this software we design a VANET path for urban areas and also we export the map with the help of an open street map.

II. NETEDIT-It is a visual network editor. To modify all aspects of existing network and create a network from scratch it is being used to process these. It is a GUI application an inputs as chosen through thehelp of menus.

Given blow are the input formats-
Net files- SUMOOSM files
Configuration file- NETCONERTOutput
Net file- SUMO XML files – plain

NETSIM- NETSIM is a networksimulation tool that allows you to create network scenario model traffic, design protocol, and analyze network performance. The various network technologies covered in NETSIM include:

- Internetworks
- Legacy Networks
- MANET
- Wireless sensor networks
- Long term Evolution

We are using NETSIM v9 standard versionin our paper we interface sumo with NETSIM with the help of generating mobility txt file. In NETSIM v10 we have VANET option so we directly export the file from sumo and give as input for NETSIM

VI. IMPLEMENTATION

Location Based Broadcast in LocationBased Broadcast, each vehicle uses its location information to decide whether it should rebroadcast a receiving packet. This algorithm can eliminate unnecessary rebroadcasting by choosing a suitable relayvehicle (e.g., in front, behind, left lane,distance, of the sender vehicle). Because each vehicle needs to know the location of the neighboring vehicles, it is necessary to exchange location information frequently among them. Cluster Based Broadcast in Cluster Based Broadcast, vehicles are grouped into clusters and a cluster head is selected from amongst the members of a cluster in the group; these cluster heads arethe only nodes permitted to broadcast. In general, the vehicles present in the same cluster have similar features, e.g., speed. Because only cluster heads are permittedto broadcast, the number of packets transmitted in the network is reduced. Although several broadcast algorithms have been proposed in VANETs, these existing algorithms are designed for general-purpose VANETs and not optimized for specific applications. There are various kinds of applications of VANETs such as a safety, infotainment, and traffic monitoring. Broadcast algorithms should be optimized based on the application characteristics. In this paper, we propose a broadcast algorithm suitable for vehicle visualization.

MDDV: A Mobility-Centric DataDissemination Algorithm for Vehicular Networks,

In this, we present the MDDV algorithm.In V2V networks, opportunities to forward messages are created by vehicle movement, so it is natural to focus on vehicle mobility. MDDV is a “mobility centric” approach that combines opportunistic forwarding, geographical forwarding, and trajectory based forwarding. A forwarding trajectory is specified extending from the source to the destination (trajectory base forwarding) along which a message will be moved geographically closer to the destination (geographical forwarding). With an opportunistic forwarding approach, rules must be defined to determine who is eligible to forward a message, when a copyof the message should be passed to anothervehicle and when a vehicle should hold/drop a message To support its decision making, a vehicle needs some approximate knowledge about the status ofthe dissemination . We motivate the designby reference to a test scenario,geographical-temporal multicast. Later we will show how to extend MDDV to cover all the services defined in Geographical- temporal multicast is formally defined as: deliver a message to all vehicles in/entering region r before time t while the data source s is outside of r. A region is defined as a set of connected road segments (for two-way roads, both directions are included). Two road segments are connected if they share an intersection. We place the source outsideof the destination region to make the problem non-trivial. We assume a vehicle knows the road topology through a digital map and its own location in the road network via a GPS device. We assume vehicles know the existence of their neighbors through some link level mechanism. But we do not assume a vehicle knows the location of its neighbors (unlike most geographic forwarding algorithms). In this way, a vehicle’s knowledge of other vehicles is limited, in order to help alleviate privacy and securityconcerns. Further it is assumed that all instrumented vehicles communicate using the same wireless channel. The message dissemination information, e.g., source id, source location, generation time, destination region, expiration time and forwarding trajectory, etc, is specified by the data source and is placed in the message header**.**

Result and Simulation

Vehicle No 50

In this scenario, we have designed through NETSIM. we show in this figure the communication between each vehicle application. These applications are given some result as like, data transfer successfully, packet collided, a packet transmitted, and simulation time.

The following below formula is used to calculate the throughput value

$$\frac{\text{total payload application succefully received by the destination}}{\text{simulation time}}$$

Throughput for 70 No.of vehicles

$$\text{Throughput} = \frac{7367160.00}{100000} = 73.6\%$$

SIMULATION ANALYSIS

- Time of simulation (ms) = 100000.00 Transmitted packets = 159441 Errored packets = 20114
- Collided packets= 40612 Transmitted bytes (in Bytes) =26453922.00
- Transmitted payload (in Bytes) = 7367160.00
- Transmitted overhead (in Bytes) = 19086762.00

RESULTS AND DISCUSSION FOR 70 VEHICLES

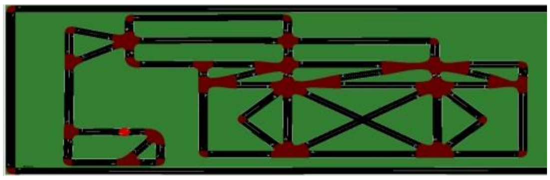
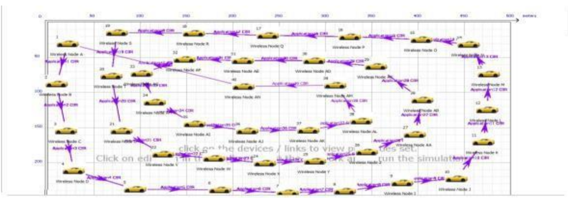


Fig (3): VANET path on NETEDIT – sumo

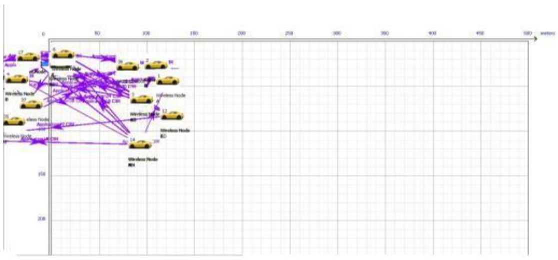
Above fig (3) Shows the NETEDIT path for 70 vehicles in this figure we design a path for 70 vehicles which shows nodes ,edges and traffic signal system.



Fig(4): 70 Vehicles Connectivity scenario on Netsim

Above fig shows the vehicle connectivity scenario on NETSIM this is the NETSIM scenario for 70 vehicles we created in NETSIM in this process we connected vehicles through application layer with specific vehicle ID.

Above fig(5 b) Shows the vehicle connectivity according to the mobility file which we create with the help of sumo configuration file this fig shows the simulation between vehicles



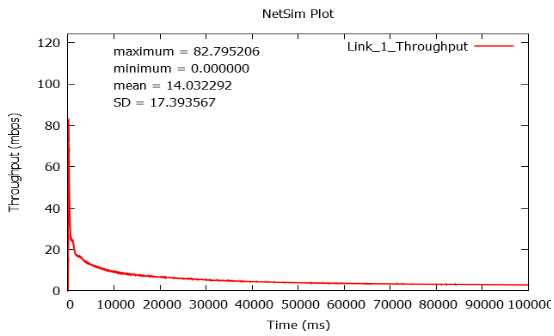


Fig (5 a): 70 vehicles connectivity scenario according to mobility file Fig(5b): Overall 70 vehicle network graph.

Above fig 5b shows that the overall graph of 70 vehicles network which shows that the maximum throughput is 82.795206mbps for overall scenario of 70 vehicles.

VII CONCLUSION

In this paper, we have analyzed Vehicle connectivity and Traffic Congestion to Prevent Accidents in Vehicular Ad-Hoc Network link and junction of sumo path for safety and security purpose. We have taken one scenario of vehicle such as 70, vehicle. We have simulated the result with the help of sumo and interface withNETSIM based on throughput and timeand identify the traffic Jam in each junctions.

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