ENCHANCED WARNING MESSAGE DISSEMINATION IN VANET

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ABSTRACT - Vehicular ad hoc networks uses vehicles as nodes, it turns every participating car into a router and create a network with a wide range. In recent years, new applications, architectures and technologies have been proposed for Vehicular ad hoc networks (VANETs). Regarding traffic safety applications for VANETs, warning messages have to be quickly disseminated in order to reduce the required dissemination time and to increase the number of vehicles receiving the traffic warning information. In the past, several approaches have been proposed to improve the alert dissemination process in multi-hop wireless networks, but none of them is adapted to the propagation features of the scenario. In this paper, we present an adaptive algorithm designed to improve the warning message dissemination process. With respect to previous proposals, this scheme uses a mapping technique based on adapting the dissemination strategy according to the characteristics of the street area where the vehicles are moving and the density of the vehicles in the target scenario. Thisalgorithm reported a noticeable improvement in the performance of alert dissemination processes in simulated scenarios based on real city maps.

I. INTRODUCTION

In roads, traffic congestion is more and accidents occur due to it. Rash driving causes loss of lives so to prevent that safety driving applications are made. To avoid accidents, Vehicular ad hoc networks (VANETs) are used which have attracted a lot of attentions due to their interesting and promising functionalities including vehicular safety, traffic congestion avoidance, and location based services. A vehicular ad hoc network is also known as a vehicular sensor network by which driving safety is enhanced through inter vehicle communication. It is an important element of the intelligent Transportation Systems. VANET uses the road side units (RSUs) in the roads every 100m so that the information about the vehicles and their position, location, driving speed of other vehicles are transferred between the RSU and the vehicles through the OBU (on board unit).

Through the RSU and OBU the messages are transferred and safety prevention of vehicles for avoiding accidents. In a typical VANET, each vehicle is installed an on-board unit (OBU) and there is road-side units (RSU) along the roads. The OBUs and RSUs communicate using the Dedicated Short Range Communications (DSRC) protocol over the wireless channel .The basic function of a VANET is to allow vehicles to broadcast safety messages (e.g. road condition, traffic information) to other nearby vehicles for avoiding possible traffic congestion.

1.1 VECHICULAR AD-HOC NETWORK

A Vehicular Ad-Hoc Networks or VANET is a technology that uses moving cars as nodes in a network to create a mobile network. VANET turns every participating car into a wireless router or node, allowing cars approximately 100 to 300 meters of each other to connect and, in turn, create a network with a wide range. As cars fall out of the signal range and drop out of the network, other cars can join in, connecting vehicles to one another so that a mobile Internet is created. It is estimated that the first systems that will integrate this technology are police and fire vehicles to communicate with each other for safety purposes.

1.1.1 Technology

In VANET, or Intelligent Vehicular Ad-Hoc Networking, defines an Intelligent way of using Vehicular Networking. In VANET integrates on multiple ad-hoc networking technologies easy, accurate, effective and simple communication between vehicles on dynamic mobility. Vehicular Ad-hoc Networks are expected to implement a variety of wireless technologies such as Dedicated Short Range Communications (DSRC) which is a type of WiFi. Other candidate wireless technologies are Cellular, Satellite, and WiMAX. Vehicular Ad-hoc Networks can be viewed as component of the Intelligent Transportation Systems (ITS).

As envisioned in ITS, vehicles communicate with each other via Inter-Vehicle Communication (IVC) as well as with roadside base stations via Roadside-to-Vehicle Communication (RVC). The optimal goal is that vehicular networks will contribute to safer and more efficient roads in the future by providing timely information to drivers and concerned authorities.

Vehicular Ad-Hoc Networks, (VANET), are a specific sort of Mobile Ad Hoc Network, (MANET), in which vehicles go about as hubs and every vehicle is outfitted with transmission abilities which are interconnected to shape a system. The topology made by vehicles is normally extremely rapid and altogether nonuniformly appropriated. With a specific end goal to exchange data about these sorts of systems, standard MANET directing calculations are not proper (Lee et al., 2010b).

The accessibility of route frameworks on every vehicle makes it mindful of its geographic area and in addition its neighbors. In any case, a specific sort of steering methodology, called Geographic Routing, gets to be conceivable where bundles are sent to a destination just by picking a neighbor who is geologically nearer to that destination. With the fast development of vehicles and roadside activity screens, the progression of route frameworks, and the ease of remote system gadgets, promising distributed (P2P) applications and remotely determined administrations to vehicles got to be accessible. For this reason, the Intelligent Transportation Systems (ITS) have proposed the Wireless Access in Vehicular Environments (WAVE) models that characterize an engineering that aggregately empowers vehicle-to-2 vehicle (V2V) and vehicle-to-base (V2I) remote interchanges (ITS, 2012).

As indicated by structures of system, VANET can be separated into three classes, the first is the Wireless Wide Area Network (WWAN) in which the entrance purposes of the cell passages are altered keeping in mind the end goal to permit direct correspondence between the vehicles and the entrance focuses. In any case, these entrance focuses require excessive establishment, which is not possible. The second class is the Hybrid Wireless Architecture in which WWAN access focuses are utilized at certain focuses while a specially appointed correspondence gives access and correspondence in the middle of those entrance focuses. The third and last class is the Ad Hoc V2V Communication which does not require any altered access focuses all together for the vehicles to impart. Vehicles are furnished with remote system cards, and an unconstrained setting up of a specially appointed system should be possible for every vehicle (Li and Wang, 2007). This study will concentrate on concentrate specially appointed V2V correspondence systems, which are otherwise called VANETs.

The motivation behind VANET is to permit remote correspondence between vehicles out and about including the roadside remote sensors, empowering the exchange of data to guarantee driving security and getting ready for element steering, permitting versatile detecting and additionally giving in-auto stimulation. As VANETs have one of a kind qualities which incorporate element topology, incessant disengagement of the systems, and differing situations for correspondence, the steering conventions for customary MANET, for example, Ad hoc On-interest Distance Vector (AODV) (Perkins and Royer, 1999) are not straightforwardly usable for VANETs.

Analysts have built up an assortment of proficient directing conventions for VANETs including Greedy Perimeter Stateless Routing (GPSR) (Karp and Kung, 2000); Greedy Perimeter Coordinator Routing (GPCR) (Lochert et al., 2005); and GpsrJ+ (Lee et al., 2007). The present issue, in any case, is that the scope of the remote 3 sensors on vehicles is constrained to a couple of hundred meters at most and the movement conditions in a vehicular urban environment regularly change progressively. Other than that, VANET steering conventions likewise confront different issues including the issue of unstructured streets, the distinction in the sizes of the crossing points in a specific zone, the sharp bends of the streets, uneven slants, and different snags, for example, huge structures, activity lights, trees, and sign sheets. As it is unrealistic to spend unnecessarily on modifying or rebuilding the current streets in urban situations, a directing convention with the end goal of a bigger separation of information correspondence in balanced and one-to-numerous exchanges particularly for VANETs should be created. This study will concentrate on the flow challenges in the examination of geological steering conventions for ongoing vehicular systems in urban situations.

A hefty portion of the remote systems that we utilize day by day at home, at the workplace or when se utilize a cell depend on those first methodologies, in which an Access Point is needed network. These setups are called 'Framework Mode' and utilize a settled and wired spine to address data from the source AP to the destination AP. In any case, in a few circumstances these systems are restricted by their own temperament because of their requirement for an AP, a base station, a few switches or switches etc. It is in these situations where an "Infrastructure-less Mode" can conquer these downsides, permitting the hubs of a system to steering and sending data for different hubs, without depending on incorporated overseer. These types of networks are called wireless ad hoc networks [1].

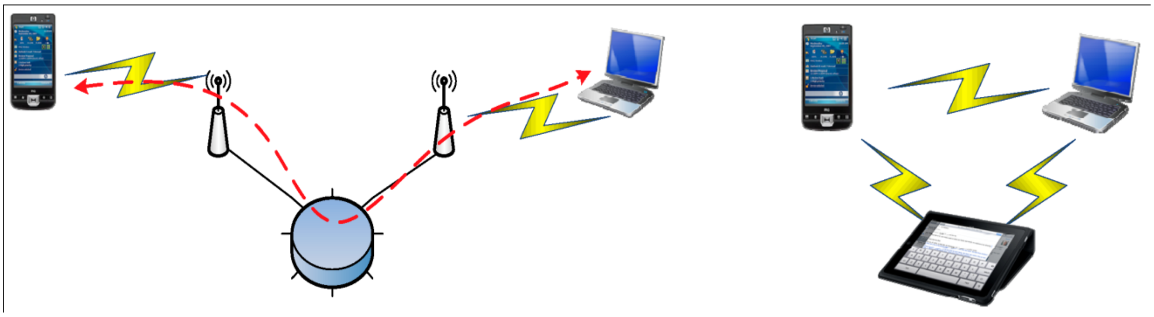


Figure 1 Infrastructure based networks

Presently, in the event that we have into thought the present patterns in innovation, it can be said that portability and universality are normal attributes to all the new devices propelled to the business sector. Clients need to be online at whatever time and all around and to get data from all the encompassing components. At that point, we discuss Mobile Ad hoc Networks (MANETs), that is, remote systems with a dynamic shape, a moving number of hubs, a characterized data transfer capacity and different qualities, where the hubs can be any sort of gadgets with correspondences and systems administration ability that speak with each other without a concentrated facilitator [2]. In this situation, every hub can assume the part of a switch, facilitating the system topology powerfully, in light of the fact that as it was said over, the shape and the topology of the net can change and also the hubs on it. The principle attributes of MANETs can be condensed as takes after [3]:

- Dynamic topologies: system topology can change rapidly because of the hubs can move openly in the net.
- Bandwidth obliges: contrast and wired systems, the limit of a MANET is generally little furthermore it is touchy to impedances, clamor, and flag blurring impact.
- Energy obliges: albeit a large portion of the hubs can be stopped to the electrical cable or they can be outfitted with huge batteries, some of them utilize little power supplies, so amid the system outline it is important to consider how to spare force so as to guarantee the steadiness and life span of the system.
- Limited physical security: in spite of the fact that the decentralized way of MANETs gives power against the single purposes of disappointment, these nets must be ensured against listening in, ridiculing, and the infusion of vindictive information assaults.

In this connection, on account of the fast increment and change of the versatile figuring a wide arrangement of remote gadgets have multiplied, making conceivable that customary equipment as computerized cameras, indoor regulators, cooking stoves or clothes washers are given correspondences and registering functionalities so they can be a piece of a MANET. This new worldview is known as Internet of Things [4], that is, a situation in which all the articles past PCs, mobiles or touch screens have the capacity of creating, sharing and preparing data in a pervasive way [5]. With every one of this, innovations more likely than not developed to new measures, designs, conventions, equipment, administrations and offices that will make conceivable a control of the path in with every one of the hubs access to the net to share their data.

One situation that speaks to superbly the qualities and it is an immaculate instance of investigation of MANETs is the Vehicular Ad hoc Networks (VANETs), a subset of MANETs, which makes remote systems between vehicles [6]. In a VANET every vehicle is a moving hub which makes remote systems with encompassing vehicles [7], on account of the On-Board Unit (OBU), an equipment with correspondences and registering capacities that permits drivers to get data about occasions that can influence his driving. At that point, the principle capacity of the OBU is to trade data with different vehicles or Road Side Units (RSUs), components situated at the framework that go about as passages between the VANET and different systems or operators as Traffic Management Centers (TMC). These focuses are put far away the VANET and assume an imperative part in the applications created in the region of VANETs, organizing the data that is shared among VANETs that are sent in various land territories.

In VANETs they can be recognize two sorts of connections: vehicular-to-vehicular correspondence (V2V), taking into account an Ad hoc engineering, vehicles trade specifically messages without a focal organizer; and vehicle-to-framework or foundation to-vehicle (V2I or I2V), where the messages are shared between the vehicles and the RSUs. VANETs are intended for an immense scope of helpful applications, that is, administrations that give data to the drivers because of the information shared among every one of the vehicles on the net. These can be security and non-wellbeing applications, which permit a few included administrations as infotainment, movement administration, toll installment, and topographical construct administrations thus with respect to [8]. That is, VANETs make conceivable to send applications that assistance to enhancing the vehicle administrations and activity conditions utilizing communitarian frameworks in light of V2X Ad hoc systems.

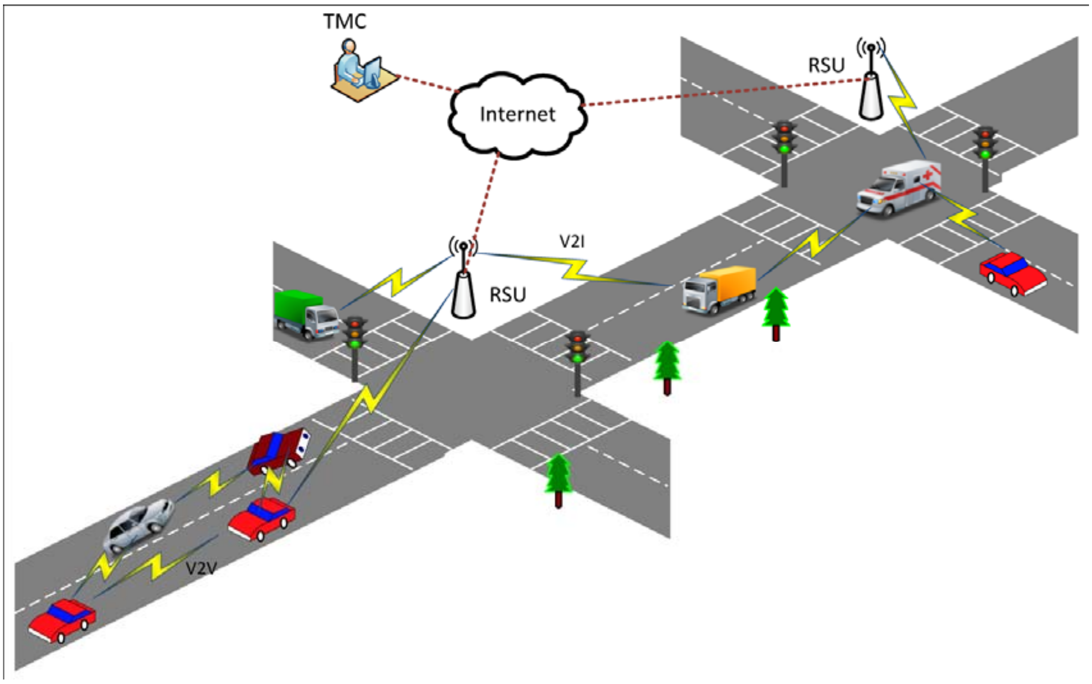


FIGURE 2.Vehicular Ad hoc Network Scenario

This presents the meaning of Intelligent Transport Systems, where every vehicle is a sender, a collector and a switch in the meantime, so it can show the data to the VANET, which utilizes this data to give these security and non-wellbeing administrations to the drivers. The OBU is the equipment responsible for preparing these information and it additionally empowers these short range remote specially appointed systems (the scope region is around 300 meters) however it likewise should arrange different frameworks that allow to report position data, for example, Global Positioning System (GPS) or a Differential Global Positioning System (DGPS) beneficiary if more exactness position data is required. This data is very essential in light of the fact that the vast majority of the administrations that are accessible in a VANET rely on upon the topographical position of the source and the destination.

II. EXISTING SYSTEM

Existing VANET adaptive systems only consider features related to the vehicles in the scenario such as density, speed and position to adapt the performance of the dissemination process. Moreover, most authors only evaluate their schemes using very simple scenarios and topologies that are not constrained by any obstacles, and where all the vehicles are in line-of-sight with each other. Unlike our proposal, these scenarios are not realistic enough to conclude that the proposed protocols and schemes could work efficiently in real VANET scenarios.

It uses Moving Direction Based Greedy (MDBG) routing algorithm for VANET that is used to enhance routing decision in packet delivery. Packets transmission over VANET is intermittent due to rapid change of network topology. This comes from both high mobility of mobile nodes and limitation of roads. Intermittent transmission causes inefficient packet delivery. Those routing protocols applicable to MANET might not be suitable for VANET. It is not useful to warn the highest number of vehicles about dangerous situations in realistic vehicular environments. It focused on dissemination in only one direction for highway scenarios. There is no efficient broadcasting of alert messages around the affected areas.

III. RELATED WORKS

Improve warning dissemination process in order to alert nearby vehicles whenever dangerous situation occur [1]. The main goal is to reduce the latency and to increase the accuracy of the information received by nearby vehicles when a dangerous situation occurs. In a VANET, any vehicle detecting any abnormal situation (i.e. accident, slippery road, etc.) should notify the anomaly to nearby vehicles that could face this problem in a short period of time. Dissemination of warning message is only for limited number of vehicles. Reduce broadcast storm problem in real map urban scenarios inorder to increase the number of vehicle receiving the traffic warning information [2]. we propose a novel scheme called enhanced Street Broadcast Reduction (eSBR), which uses location and street map information to facilitate the dissemination of warning messages in 802.11p based VANETs. eSBR algorithm in a realistic urban scenario, with a complex set of streets and junctions, and demonstrate how it could improve performance. The percentage of vehicles receiving warning message increase to a greater extent which may lead to collision.

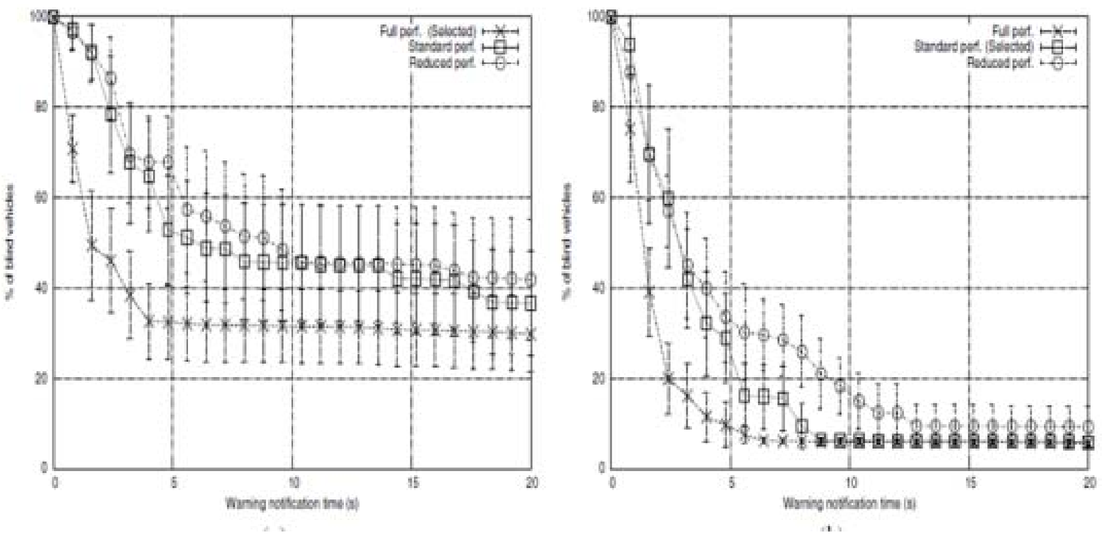
To select a unique relay to reliably forward emergency message in desired propagation direction[3]. The main contributions of this paper are three-fold. First, design a novel metric for selecting a proper relaying node to forward the emergency message. Second, based on the derived metric, a cross layer protocol is proposed to efficiently broadcast emergency messages in IVC. Third, NS-2 simulations are conducted to evaluate the performance of the proposed protocol, in terms of packet error rate (PER) of the emergency message, relay selection delay, and emergency message access delay. Simulation results show that the proposed cross layer approach can quickly and reliably deliver emergency messages while minimizing the broadcast message redundancy. To avoid the undesirable dependency on vehicle density by making link between the mathematical science of continuum percolation and stochastic broadcast [4]. Several techniques have been proposed to reduce the number of broadcasts from pure flooding. These can be categorized as counter-based, distance-based, location-based, cluster-based and stochastic. Counter-based schemes limit the number of times a packet is rebroadcast. The distance-based method considers received signal strength when deciding to rebroadcast, with the goal of only rebroadcasting at the border nodes. Location-based considers the amount of additional area a rebroadcast will cover and cluster-based imposes a topological structure on the nodes and directs only certain nodes or clusters to retransmit broadcasts. Finally, stochastic schemes rebroadcast packets according to some probability. Practical broadcast protocols are generally a hybrid of these fundamental types.

IV. PROPOSED SYSTEM

We present an adaptive algorithm for warning message dissemination that dynamically modifies some of the key parameters of the propagation process, such as the interval between notifications and the selected broadcast scheme, to achieve an optimal performance depending on the features of the roadmap in which the propagation takes place. Adapting to the specific environment where the vehicles are located can be beneficial in order to reduce broadcast storm related problems, and also to increase the efficiency of the warning message dissemination process. Existing adaptive techniques for VANETs only make use of the vehicle density to adapt the process, this information in not enough in many situations to determine the most effective configuration. Our proposal is combined with a previously presented broadcast storm reduction technique, the enhanced Street Broadcast Reduction (eSBR) to achieve better performance in warning message dissemination by reducing the notification time.

However VANET has some drawbacks such as broadcast storm disrupting network communication, rapid topology changes. These problems need solutions to improve VANET's performance. In this paper we propose a new approach to reduce broadcast storm and improve performance for safety alert application in VANET. It should allow efficient broadcasting of alert messages around the affected area. Reduce broadcast storm problems and also the notification time.

V. SIMULATION WORK



(a) (b)

Fig: 3 Comparison graph (a) Existing System (b) Proposed System

In this graph, figure (a) shows the time taken by existing system to send the warning message and figure b shows the time taken by proposed system to transmit the warning message.

From the graph (b), it is clear that the tine taken by the proposed system to deliver the warning message is lower. So, proposed system is better when compared to existing system.

Advancement of versatile activity signal planning is one of the most intricate issues in activity control frameworks. This paper exhibits a versatile travel signal need (TSP) technique that applies the parallel hereditary calculation (PGA) to improve versatile movement signal control within the sight of TSP [9]. A picture handling framework to quantify vehicular lines in methodology paths of a crossing point. Television cameras of this framework are introduced at a tallness of 10 m or so at an crossing point to take pictures of movement inflows at a bird's-eye view. This framework utilizing a plainly visible discovery technique permits estimation of line lengths up to 300 m long if the perceive ability is great the proposed strategy takes after the ideal split regardless of the possibility that the activity inflow designs change, and averts expanding the postponement.

The present paper presents a versatile technique for responsive control that conforms the stage spans concurring to movement streams. The philosophy utilized for this is surmised dynamic programming, which utilizes a state dependent appraisal of future upgraded expenses to evaluate choices. Results are displayed for instance applications, demonstrating good execution by examination with other approaches [11].

Hurry is the most generally executed framework. It comes from the UK with more than 200 establishments around the world counting the US. Normal deferral decreases of 20 percent have been appeared in urban systems that utilize versatile signal control frameworks. Hurry keeps running on the VMS working framework, CORSIM on Windows NT. In a finished circle, the improved sign planning is then imparted from SCOOT to CORSIM, which actualizes the planning and upgrades the activity reproduction [12].

This paper exhibits a system for constant transport need control framework. This inferred system makes one control focus and two modules, identification correspondence module (DCM) and sign need control module (PCM)[13]. The development of new innovation called as clever movement light controller, this makes the utilization of sensor n/w alongside implanted innovation. Where activity light will be insightfully chosen in view of the aggregate activity on every single adjoining street. In this way advancement of movement light exchanging expands street. Limit, activity stream and can avoid activity clogs [14]. The versatile satirized frameworks have been embraced to expand the framework limit by adjusting activity in a cell. It is important to know precisely the movement of every tight pillar for working the versatile satirized framework viably.

Fig: 4 RSU configuration

In RSU configuration the RSU id and the location in which place it must be located are given and the information are added to the database. The distance-based method considers received signal strength when deciding to rebroadcast, with the goal of only rebroadcasting at the border nodes. Location-based considers the amount of additional area a rebroadcast will cover and cluster-based imposes a topological structure on the nodes and directs only certain nodes or clusters to retransmit broadcasts. Finally, stochastic schemes rebroadcast packets according to some probability. Practical broadcast protocols are generally a hybrid of these fundamental types.

The final output of our project is displayed above.The output is a road map which has roadside unit (RSU) and nodes (vehicles). Initially we specify the RSU by setting its ID and location. Then we set the number of nodes (vehicles) in that area. With the help of sensorid we will track the current location of the vehicle. If any problem occurs, warning messages are sent to vehicles based on the vehicle id. RSU will transmit the messages to nearby vehicles and the vehicles in turn will sent the message to the neighbor vehicles in that area. By using this technique we will send the warning messages to all the vehicles, avoid the traffic and make the road safe.

VI. CONCLUSION AND FUTURE ENHANCEMENT

In this paper, a novel distributed key management scheme based on the short group signature to provision privacy in the VANETs. The distributed key management is further enhanced with a cooperative message authentication protocol to reduce the heavy computation overhead. To investigate the challenging issue that semi-trust RSUs may be compromised, and compromised RSUs may even collude with malicious vehicles. By designing a security protocol to prevent compromised RSUs and malicious vehicles from attacks.

The use of larger and more realistic VANET scenarios for evaluating in a more realistic way the fitness function. Additionally, studying how the network sizes affect the performance of these optimization techniques. Optimizing other protocols used in VANETs (such as DSR, UDP) through the use of the strategy used that coupling Meta heuristic techniques and a realistic VANET simulator.

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