A REVIEW ON STATISTICAL FILTERING TECHNIQUES FOR ROUTING IN VANET

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ABSTRACT

Routing of Vehicles and Congestion control in VANET is a widely researched issue in recent years. Many techniques have been proposed in the recent times which efficiently and effectively handle both traffic congestion and packet congestion. Many techniques involves statistical filtering algorithm which predicts the vehicle velocity and the distance so as to avoid the congestion. In this paper many techniques proposed by researchers have been discussed and compared with their counterparts. The parameters of comparison varies from a wide range from packet delivery ratio to the average end to end delay to throughput.

KEYWORD: VANET, Statistical Filtering, Bayesian Algorithm

INTRODUCTION

The Vehicular Ad-hoc Network has been studied in various fields, since it hascapability to divide a variety of services, such as detecting nearest collisions and giving warning signals to aware driver. These services are provided by VANET often based on association or among vehicles which are furnished with a relatively motion sensors and GPS units. Awareness of the specific location is vibrant to the every vehicle in VANET so it can provide an accurate data to aristocrats. At present, typical localization methods integrate the GPS receiver data and measurements of vehicle gesture. Although, when the vehicle passes via backgrounds that generate a multipath outcome, so these techniques are failed to produce high localization accuracy, which they attain in several open surroundings [3]. Unfortunately, the vehicles travel in an environment that cause multipath outcome, like areas with high buildings, tunnels, or trees. This research has been designed to minimize an effect of the multi path outcome with respect to localization accuracy of the automobiles in VANET. More so, the planned procedure firstly detects if there is any noise in vehicle place than it will estimate which is caused by multipath outcome which using the neural network procedure. It takes benefit of communications among VANET vehicles in order to attain more information from the vehicle's neighbours, like distances from the target vehicle and their places estimates [4]. The proposed method assimilates all the pieces of information with vehicle's own information and data or applies the optimization techniques in order to minimize the place.Traffic on road is big problem today. Multiple hours and tons of fuel is wasted everyday by these vehicles jammed in traffic. Congestion detection is one of the multiple applications of VANETs or it didn't design to be used as means for an automated driving rather as tool to deliver information to driver which will help her/him make decisions to avoid the heavy traffic [7]. Design traffic congestion detection system which will have good influence on budget, the surroundings or society in general letting us to spend less time stuck in the traffic or more time doing any creativity. The Vehicular Ad-hoc Network has been presented in various areas, such as detecting nearest collisions and giving warning signals to aware driver. Since VANET has ability to provides a variety of services. These services are provided by VANET often based on association or among vehicles which are furnished with a relatively motion sensors and GPS units. Awareness of the specific location is vibrant to the every vehicle in VANET so it can provide an accurate data to aristocrats.The problem of congestion in Vehicular Ad-hoc Network is a most widely researched problem in recent years. Many researchers use various machine learning algorithms to solve the problem of congestion. This proposed work includes use of Kalman Filter to solve the problem of congestion and to find the optimum route for the vehicle. Guaranteeing a stable and reliable routing mechanism over VANETs is an important step toward the realization of effective vehicular communications.

Existing routing protocols, which are traditionally designed for MANET, do not make use of the unique characteristics of VANETs and are not suitable for vehicle-to-vehicle communications over VANETs. Indeed, the control messages in reactive protocols and route update timers in proactive protocols are not used to anticipate link breakage. They solely indicate presence or absence of a route to a given node. Consequently, the route maintenance process in both protocol types is initiated only after a link-breakage event takes place. When a path breaks, not only portions of data packets are lost, but also in many cases, there is a significant delay in establishing a new path.This delay depends on whether another valid path already exists(in the case of multipath routing protocols) or whether a new route-discovery process needs to take place.Vehicles are equipped with storage and processing devices that enable them to store and process data from other vehicles and access points. Enabled vehicles can then use on-board devices to form on-demand ad hoc networks which can be used to provide a variety of useful services.

RELATED WORK

Younes, MaramBani et. al [1] In this paper, congestion detection protocol has been proposed. This protocol is used to detect the segments of road having high load of traffic congestion by utilizing cooperative vehicular communication. The proposed protocol uses multi-hop communication and every vehicle may calculate and give reports to its segmented road as per the given direction effectively. The result indicates the proposed system performs far better as compare to already existing approaches which uses different scenarios and it is implemented on NS-2.

Terroso-Sáenz et al. [2]this proposes an even driven architecture. It is basically a mechanism to obtain VANET message to find distinct levels of traffic jams. The propose architecture is being produced through the complex technology. The simulation indicates that the proposed architecture may find the traffic congestion that includes the distinct number of lanes and length having short delay.

Younes, MaramBani [3]secure congestion control protocol has been proposed in this paper. The proposed protocol may maintain the reliability and genuineness of the data which is transmitted. The proposed protocol is particularly designed to give the safety requirement of traffic protocol which has been given by utilizing the technology of VANET. The proposed protocol main goal is to protect the cooperative vehicles and drivers. The result indicates that the proposed protocol find the malicious nodes over the network of road that increases the accuracy of traffic efficiency applications.

Younes, MaramBani[4] proposed a protocol for congestion detection which having goal to finding the traffic characteristic of every road segment. The proposed protocol is efficient and reliable which finds the road segments having high traffic congestion in any grid layout. The level of congestion and traffic situation of every road is varied from time to time. In order to execute the proposed protocol, Proactive, reactive, and hybrid iterative execution strategy has been introduced.The proposed protocol is discussed and its performance is compared with already existing protocol in this particular field and result shows that proposed protocol attains 30% precise evaluation of traffic characteristics compared to other traditional protocols.

Wongdeethai, Singha, and PeeraponSiripongwutikorn. [5] Presented a RTC protocol to collect the traffic information in vehicular ad hoc networks on roads. Moreover, the RTC (road traffic control) protocol uses the message exchange pattern in order to enhance the reliability of query delivery. The results demonstrated that proposed protocol can gather 100% of traffic information

PM Dhanya et al. [6] proposed the major goal of CEP system is to track and detect real world situations, known activities such as traffic congestion along a motorway. In the summing up, some are reflected as clouds of the interrelated rough events in lowest layer of an IS. In present scope, the target IS has own VANET. The CEP system gets as input of the rough events and creates a layered hierarchy of the events with individual levels of the abstraction to compose one and more complex of events which represent an initial real-world activity. These complex events can be sent to back-end system that performs some kind of actions or procedures.

Darus, Mohamad Yusof [7] et al. proposed an event driven detection method that monitors an event-driven safety message or decides to initialize the congestion control algorithm. When an event-driven safety message is detected and generated. The congestion control will be launched immediately the queue freezing technique for the all MAC transmission queues that except for an event-driven safety message. Follow the order to send an event-driven safety message with minimum delay, the lower priority messages like as beacon messages emission has breezed. Presently, an event-driven detection method is used in existing of congestion control algorithm.

Marwa Altayeb1 and ImadMahgoub et al. [8] presented A Survey of Vehicular Ad hoc Networks Routing Protocols. The objective is to give a survey of the VANETs routing mechanisms, this paper gives an overview of Vehicular ad hoc networks (VANETs) and the existing VANET routing protocols; mainly it focused on vehicle to vehicle (V2V) communication and protocols. The paper also represents the general outlines and goals of VANETs, investigates different routing schemes that have been developed for VANETs, as well as providing classifications of VANET routing protocols (focusing on two classification forms).

CONCLUSION

Traffic Congestion is a widely researched issue in recent time. It is an important part in designing the autonomous vehicular solution. Many new approaches have been proposed in the recent past which includes the intra vehicular and inter vehicular communication. Vehicles can communicate with each other to detect the congestion on roads and can be passed to all the vehicles in range. In other approach a secure protocol is proposed which maintains the genuineness of data while transmitting and also responsible for the delivery of packets in the network. A queue freezing technique is also implemented which freezes the queue in case of some emergency message is generated and vehicle will only receive that emergency message. There is also the possibility of detection of congestion through advanced non linear statistical algorithms in the future.

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