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# Analysis of Routing Techniques of VANET

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**ABSTRACT**

*The vehicular ad hoc network is decentralized type of network in which vehicles nodes can join or leave the network. Due to such type of network routing, security and quality of service are the major issues which affect network performance. This review paper is related to path establishment in vehicular ad hoc networks. The various techniques are proposed so far for the shortest and reliable path establishment. In this paper, various techniques of route establishment are reviewed in terms of certain parameters*

***Keywords:*** *VANET, Route establishment, Reactive*

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## INTRODUCTION

The smart cities that are evolving with each day need to be provided with some safety, comfort, quality and mobility improvements. To ensure these factors in several applications a new technology is introduced named Intelligent Transport Systems (ITS). For developing ITS in different applications the Vehicular Ad hoc Networks are considered to be very important. Researchers from all across the globe have been attracted towards this study. The vehicles travelling on road are ensured with safety, traffic efficient as well as comfort level through VANETs. Due to some special characteristic properties, VANETs are considered to be completely different from other networks [1]. Depending upon the speed of VANETs, the path is chosen which also helps in knowing the dynamic topology. There is a need to generate another link towards the closest vehicles in case a seamless connectivity is required. A proper connectivity towards the nodes position and mobility is provided through this feature. It also becomes difficult to check the factors due to the nature and patterns of mobility of vehicles [2]. For designing an effective network design generating its mobility model is very important. From the existing highways available in the cities, a huge difference in the mobility model is observed. The node prediction design and algorithms of routing are adapted by the required changes. Continuous power provided to node/vehicles is necessary for performing computing and communication. The time delivery of message to the destination node is considered to be an important factor for ensuring safety of VANETs. The network cannot compromise the delay in data towards the relevant node. The designing of dynamic routing protocol is one of the important challenges being faced when designing VANETs [3]. Since the topology of VANETs changes very frequently, several modifications have been made in routing procedures for VANETs within newly designed approaches. For MANETs, several routing protocols were designed which are also implemented and tested for VANET scenarios. The delay caused in forwarding the information from one node to other needs to be reduced on priority. It is possible to implement the routing protocols in real time VANETs for removing the challenges which are previously faced in MANETs [4]. The routing protocols are applied to control the unpredicted and dynamic nature of

vehicular network topologies by examining the dynamic properties of VANETs carefully. The identification and maintenance of optimal communication paths is the most difficult process for VANET routing. As per the topology being used in the network architecture, the routing protocols of VANET can be connected. During the change of network topology, the performance also gets affected. The geographical position is required to perform communication among source and destination nodes using protocols [5]. To ensure that the beacons are being transmitted at regular time interval, communication among neighboring nodes is provided using the geographical positioning of nodes. The application of Cluster Based Routing (CBR) is done to reduce the overhead and traffic of VANETs. Clusters are the small groups of vehicles which are used to generate the routing in network architecture. Cluster head represents one of the vehicles present in a cluster. On the designing of the routing algorithm the size of a cluster is dependent [6]. One of the traditional routing approaches of VANETs is broadcast routing. The outside range can be forwarded of a vehicle as the broadcast routing mechanism. The packets and flooding techniques are applied for the transmission. Across the network the routing approach ensured the delivery of the data. For the extensive resources of bandwidth are included through this approach [7]. Within specific regions which need to handle dissemination of data this type of routing performed. Various geocast routing approaches are proposed because of the increase in the usage o the VANETS's.

## LITERATURE REVIEW

Zhiwei Yang *et al.* [8] proposed a new clustering mechanism through which the vehicular navigation systems related information was provided [8]. The overlapping time amongst vehicles was evaluated depending upon the route information which also usedresidual route time function. The previously proposed and newly proposed algorithms were compared to evaluate the performance levels of both. It was seen that in terms of different performance parameters, the stability of clusters was improved by implementing proposed technique. Also the costs were minimized in proposed technique.

Yangyang Xia et al. [9] proposed a novel traffic light and queue aware routing protocol [9]. When providing vehicle clustering during intersection and balancing the traffic load related to vehicles, several improvements have been made when implementing the proposed approach. It is seen that the designed approach is better as compared to existing routing protocols which are position-based as per the simulation results.

Abdul Kareem Basil et al. (2017)proposed a novel routing protocol named as OSLR [10]. NS3 simulator was implemented in this research to evaluate the performance of AODV values. In these applications, a general geographical topology was applied. In the congestion area several important properties were achieved. In comparison to other routing protocols, the performance of proposed protocol was known to be better in terms of several performance parameters.

Wenxiao Dong *et al.* [11] proposed cluster-based recursive broadcast (CRB) with the objective of resolving problems being faced by the scientists [11]. The chosen vehicles are responsible for performing re-broadcasting in the networks. The efficiency of forwarded message is improved and broadcasting is achieved with the help of implementing CRB along with traffic light signal. It was seen that in term of delivery time and delivery ratio the performance of proposed algorithm was known to be better. It was seen that the storms related issues were resolved and in terms of high vehicular density and message ratethe performance of proposed algorithm was known to be better than flooding mechanism.

Seung-Seok Kang *et al.* [12] proposed a new road traffic simulator named as SUMA in order to reduce the traffic related challenges [12]. This proposed simulator is a sub-part of the NS3 simulator which is computer-based. The real time traffic present on roads and vehicles are monitored by applying the proposed simulator. The information is transmitted to the network due to which the performance of packet delivery ratio is also affected as per the simulation results achieved by implementing DSDV routing protocol. Thus, it is seen that the performance of proposed simulator is better and of high speed as per the results achieved.

HarinderKaur *et al.* [13] proposed two routing protocols for analyzing the real city map [13]. They were commonly known as Aware routing (A-STAR) and Greedy Perimeter Stateless Routing (GPSR). Accurate results are achieved which help in designing and developing

VANETs as per the simulations performed and results are achieved. On the map of Bathinda, the GPSR and A-STAR were applied which showed that the performance of A-STAR was better in comparison to the other technique. Thus, in comparison to the existing routing protocols, the performance proposed protocol is better.

A. Malathi *et al.* [14] proposed a novel routing algorithm for routing by applying which, the different challenges of multicasting were resolved [14]. The cluster based routing performance of VANETs was utilized in this work. For generating an effective routing path, the HSSABC optimized algorithm was applied. A comparative analysis of previously generated routing protocols was proposed in this research to evaluate and compare them with newly proposed algorithm. With respect to certain performance parameters, the performance of proposed algorithm was known to be more efficient.

## CONCLUSION

In this paper, it is concluded that vehicular ad hoc network is decentralized type of network which vehicles can join or leave the network. The vehicles have very high mobility due to which path establishment is very difficult. In this paper, various techniques of path establishment is reviewed and analyzed in terms of certain parameters

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