

## Research Paper

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## FINDING SHORTEST PATH IN VANET: A SURVEY

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**Abstract**

Vehicular Ad hoc Networks (VANET) is an increasing technology among vehicles which provides Intelligent Transport System (ITS) technology. VANET is a subcategory of MANET in which the vehicles act as mobile nodes for transferring data. This in turn increases the importance of bandwidth efficiency by maintaining requirements on energy consumption, delay and throughput. The existing system employs greedy forwarding algorithm in which the message transferred from source to destination by any path. It does not choose the optimum path for transferring message every time so that it doesn't lead efficient QoS. So far there are many improvements in vehicular advancing features has moved organizations, foundations to focus their activities on enhancing street security and it is of principal need now a days. This article provides the information about finding shortest path in VANET.

**Keywords**—VANET, protocols, message, algorithm, optimal, obstacle.

**INTRODUCTION**

Vehicular Ad hoc Network (VANET) is a kind of wireless ad hoc network. An ad hoc network is not a centralized type of network since it does not rely on routers or hubs. Ad hoc networks comprises of nodes for data transmission i.e. the data is transmitted between the nodes. The transmission of data takes place by means of flooding mechanism. VANET is implemented based on the principle of MANET. VANET finds its place in research, standardization and development fields because it provides tremendous improvement in vehicle and road safety, traffic efficiency and facilitates comfort zone to both drivers and passengers. In VANET each vehicle acts as nodes so that the communication takes place between vehicles which acts as nodes. Vehicles

communicate with each other by making use of some artificial intelligence mechanisms embedded in them. The invention of VANET is a boon nowadays because there is an increasing number of an accident per day all over the world which takes away millions of lives. Such network is comprised of sensors and On Board Unit which is connected in both vehicles and Road Side Unit (RSU).VANET have many properties that differentiate them from other MANET. Vehicles in VANET are highly movable, end to end connectivity and group communication is not guaranteed. Moreover, VANET have dynamic topologies, so they are not random completely. The movement of vehicles in a VANET is predictable because it is not committed to the roads on which the original vehicles travel. Mostly all vehicles provide enough computational and

power resources, that eliminating the need for introducing difficult one. Vehicles will not be suffered by the complementary of extra weight for antennas and hardware and this network attract great academic attention. The main objective of VANET systems is to provide safer transport which tends to eliminate accidents. Besides providing safety measures, it also acts as a powerful communication tool for users. It will need to create these components, incorporating the applicable criteria that follow.

### Characteristics of VANET

VANET has its own unique characteristics when compared to other types of MANET. Some of them include:

#### *Predictable mobility*

The nodes in VANET move in a predefined way because the road layout are fixed and the vehicles have to abide by the traffic rules.

#### *Geographic position available*

Vehicles can be equipped with GPS tracker to gather information for routing purposes.

#### *Variable network density*

The density of the network varies depending on the traffic jam whether the traffic is low or high.

#### *High computational ability*

It increases the computational power of node which helps to collect information about node's current position, speed and direction and also helps to provide reliable wireless communication.

### Architecture of VANET

VANET architecture is divided into five layers based on the network point of view

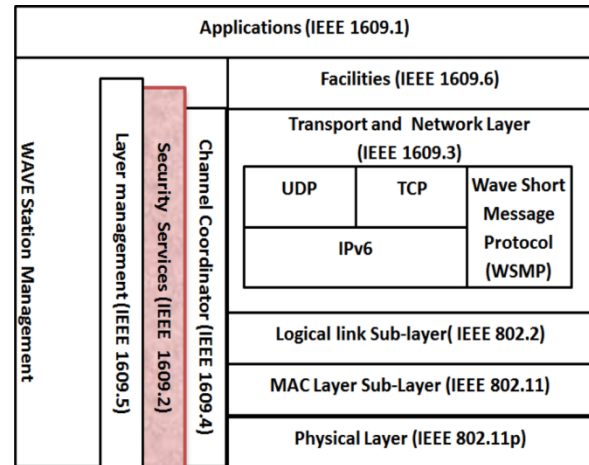


Fig 1: Architecture of VANET

In figure 1 the layers are:

#### *Physical layer*

It involves issues concerning antenna, modulation, spectrum allocation etc.

#### *MAC layer*

It avoids transmission collision on VANET to achieve reliable and efficient medium access control (MAC) protocol.

#### *Network layer*

It relates to wireless multi-hop communication based on geographic addressing and routing and performs traffic congestion, vehicular movement and data dissemination.

#### *Transport layer*

It involves transportation of data to intended recipients by avoiding delay and to improve reliability.

#### *Application layer*

It is broadly classified into safety and non-safety applications. Safety application deals with safe transportation by reducing traffic whereas non-safety applications provide services such as internet access and also it delivers entertainment services to passengers which is a time saving application.

## RELATED WORKS

Ali Ghaffari in his work on An Energy Efficient Routing Protocol for Wireless Sensor Networks using A\* Algorithm has proposed an energy efficient routing protocol for wireless sensor networks using A\* algorithm and considered that the sensors are the significant component of electronic devices. The energy-efficient routing protocol approach will enhance the lifetime of the wireless sensor network by routing the packets through the optimal path when compared to the fuzzy logic algorithm and the A\* algorithm. Wei YINa and Xiaoguang YANG in their work on A Totally A\*based Multi-path Algorithm for the Recognition of Reasonable Route Sets in Vehicle Navigation Systems has proposed an algorithm called a totally A\*based algorithm. This algorithm has computing speed and veracity in a large scale road network than the Dijkstra based but the A\* algorithm has little connection with the overall scale of a road network. This algorithm collects all the information about the optimal geometric routes and provides different types of conditions that satisfy the driver. The advantage is the totally A\* based algorithm enhances the veracity and the computing speed in the large scale network. Marwane Ayaida et al. in their work on Joint routing and location-based service in VANET has proposed a method to reduce the location overhead in the network by correlating the routing protocols along with the location based services. The geographic routing protocols are used for the location information. The location based services will maintain the location information which will be provided by network nodes in a distributed manner. Ant3nio Fonseca, Teresa Vaza in their work on Applicability of position based routing for VANET in highways and urban environment made a comparison between the topology based protocols and the position based protocols.

Several position based routing protocols are proposed in this paper and those protocols are compared among themselves using different metrics.

## A. ISSUES

The Greedy Forwarding algorithm slows down the transfer process of packets. It also makes the packets to be blocked in some scenario which increases the rate of data loss. Hence the efficiency of transmission is reduced. The data transmitted between nodes is less secured. Hence there is an increased chance of hacking of data. The disadvantage is that it is entirely possible that the most optimal short-term solutions may lead to the worst possible long-term outcome. Greedy algorithms are often used in ad hoc mobile networking to efficiently route packets with the fewest number of hops and the shortest delay possible. Existing approaches are not scalable since they not cover group communication

## RESEARCH DIRECTION

1. If K-means algorithm is being implemented in VANET vehicles are clustered and the head of each cluster is selected by using K-means technique. The centroid of the cluster is selected as cluster head.
2. If A\* algorithm is being implemented in VANET it will be mainly used for finding the path between the source and destination. Although this algorithm provides the shortest distance between the source and destination, it does not provide optimal solution.
3. If intrusion algorithm is being implemented it will be used for detecting whether any intrusion occurs in that particular cluster. So that it reduced the throughput and delay in transmitting messages.

## DISCUSSION

The authors Wei YINa and Xiaoguang YANG in their work on “A Totally A\* based Multi-path Algorithm for the Recognition of

Reasonable Route Sets in Vehicle Navigation Systems” had proposed an algorithm named a totally based A\* algorithm which computes speed and veracity in a large scale road network than the Dijkstra algorithm. This approach collects all the information about the optimal geometric routes and provides different types of conditions that satisfy the driver. Even though it satisfy the driver the algorithm is very difficult to find different path in large network

## V. CONCLUSION

In this paper, we proposed a model for the performance analysis and clustering design in VANET. The existing model integrates MAC protocol operations, PHY layer wireless channel conditions, and the moving pattern of the vehicles. Our survey aims to determine the suitable cluster size, typical network span and adequate data traffic control to achieve the desired system reliability and network throughput. The performance of communication is accomplished. As our research we are choosing that the above algorithms with some advancement to find the shortest path from source to destination in VANET.

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