# A Survey on Embryonic Graph-Based Unfailing Routing Method for VANETs

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**Abstract**

VANETs are a hopeful technology to enable communications among vehicles on highways. The routing protocol works very poorly in VANETs. Compare to MANET, communication links break more frequently in VANETs, so we need unfailing routing method of such highly dynamic network. Nowadays, in highways the unfailing routing has focused very little. In this paper, we need embryonic graph theory to model the VANET communication graph on a highway. The embryonic graph helps taking the expanding characteristics of the vehicular network topology and determines the unfailing routes preemptively. In this paper, we introduce an embryonic graph-based unfailing routing method for VANETs to promote quality-of-service (QoS) support in the routing process. So we introduce new method to find the most unfailing route in the VANET embryonic graph from the source to the destination. We determine, over the simulation results, that our scheduled method significantly outperforms the relevant protocols in the literature.

**Keywords**— Embryonic graph, quality of service (QoS), routing, vehicular ad hoc network (VANET), vehicular networks.

## 1. INTRODUCTION

**E**VERY DAY, a lot of people die, due to traffic accidents in the world. The desire to diffuse road safety information among vehicles is to prevent accidents and improve road safety using vehicular ad hoc networks (VANETs). VANETs are a fulfill technology to enable communications among vehicles on highways. They are a special form of mobile ad hoc networks (MANETs) that provide vehicle-to-vehicle communications. Each vehicle is implemented with a wireless communication facility to provide ad hoc network connectivity. Each vehicle in the network can send, receive, and deliver messages to other vehicles in the network. In this system vehicles can interchange real-time information and drivers can be posted about road traffic conditions and other relevant information's. VANETs have very enthralling and different features, differentiating them from other types of MANETs. The special characteristics of VANETs increase the most important technical demanding that must be designed to deploy these networks completely. The better imposing issue is probably the high mobility and the continuous changes of the network topology. Network topology could differ when the vehicles change their velocities in VANETs. These all the changes based on the drivers and road conditions and are normally not deserved in earlier.

The graph theory can be applied to help the understanding of topological properties of a VANET, where the vehicles and their communication links can be formed as vertices and edges in the graph, correspondingly. Recently, a graph theoretical model called Embryonic graph has been proposed to capture the powerful behavior of dynamic networks when mobility patterns are anticipated. This model has displayed its hopeful results in MANETs and delay-tolerant networks. Yet, the current embryonic graph theory can be only utilized when the topology dynamics at different time intervals can be anticipated; these are known as fixed scheduled dynamic networks (FSDNs). VANETs cannot be consider as FSDNs, and hence, the existing embryonic graph theory cannot be directly applied to VANETs. Auspiciously, the arrangement of topology dynamics of VANETs can be predicted using the underlying road networks and the possible vehicular information. We can analyze this type of network is named as predicted pattern dynamic network. Consequently, the current embryonic graph theory could be extended to deal with VANETs.

The objective of this paper is to propose a novel embryonic graph-based unfailing routing method for VANETs. This system says its various designs of unfailing routing protocol that regards the topological properties of the VANET communication graph using the extended Embryonic graph. Considering that vehicles travel at high speeds on roads, the data delivery service could have multi interruptions due to continuous link breakages. It is most important to provide that the most unfailing links are selected when building a route. Some of the major contributions are given here.

1) New link unfailing models depend on the mathematical distribution of vehicular movements and velocity on the highway.
2) The current embryonic graph model is extended to capture the expanding features of the VANET communication graph, and the link unfailing metric is considered.
3) A unfailing routing protocol is performed to benefit from the advantages of the extended embryonic graph model to find the most unfailing route without transmission the routing requests each time a new route is desired. In this system the routing overhead is well compressed and the network Resources are preserved.

## 2. VARIOUS ROUTING METHODS

Table 1
Analysis of routing unfailing method

| S.no | Title | Process | Future work |
|---|---|---|---|
| 1. | Link reliability method for vehicle ad hoc networks[1] | To develop a novel link unfailing model for vehicle ad hoc Networks based on road density and relative speed. | How to manage link reliability as a QoS metric that is required by certain vehicular applications. |
| 2. | ACCR: Ad-hoc On-Demand Distance Vector Routing With Controlled Route Requests[2] | To introduce a non cryptographic solution to control the number of fake packets can be generated. | To control the packets better and more flexible. |
| 3. | Sensor network on the road: the promises and challenges of vehicular ad hoc networks and grids[3] | It describes the application of vehicular sensor networks in future brilliant traffic control and management system. | Sensor networks will be used in long range of wireless communication. |
| 4. | A Reliable Routing for Vehicular Ad Hoc Networks Using Embryonic Graph[4] | It states that a direct communication link between two vehicles will stay continuously available over a specified time period using link reliability technique. | Maximization of time period. |
| 5. | Investigation of routing reliability of vehicular ad hoc networks [5] | Intelligent transportation systems, the unity between vehicles and the road side units is necessary to bring these systems to satisfaction | The contact of wireless channel noise errors on the link reliability model and recognizes more routing constraints such as delay in our developed routing protocol will be our future extensions. |
| 6. | Routing protocols for vehicular ad hoc networks [6] | It is a challenge to protect reliable, continuous and absolute communication in the presence of speeding vehicles using adaptive and context-aware routing protocols | Simulation of multicast routing protocols (single source to multi-destination). |
| 7. | An efficient vehicle-heading based routing | This paper dispute the use of information on vehicle headings to predict a | Increasing end-to-end throughput and to deliver the message from source to group of destination with more reliable. |

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|---|---|---|---|
| | protocol for VANET[6] | possible link breakage and vehicles are combined according to the velocity using VHRP. | |

## 3. CONCLUSION

In this paper, we defined that vehicles moved at a constant velocity along the same direction on the roads and that the source vehicle has complete knowledge of a VANET communication graph at any time. In future we concentrate on Bidirectional traffic and different vehicular velocities.

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