# DSDV Addendum through Genetic Algorithm in VANET

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## ABSTRACT
Vehicular Ad-Hoc Networks (VANET) is a variety of Mobile Ad Hoc Network (MANET), in which vehicles work as nodes and each vehicle is prepared with transmission capabilities which are interrelated to form a network. Routing protocols are the backbone of VANET. In this paper, to apply the genetic algorithm to improve the performance of DSDV. The objective of this paper is to find optimal path from source node to destination node and to increase the throughput of DSDV. Hence to proposed work has shown the better results by considering parameters performance like throughput, packet delivery ratio, End to End Delay. Simulation outcome show that the planned algorithm is more efficient.

## Keywords
Genetic Algorithm, VANET

## 1. INTRODUCTION
VANET is a submission of mobile ad hoc network. More accurately a VANET is self-organized network that can be shaped by linking vehicle aim to get better driving safety and traffic management with internet access by drivers and programmers. Two types of statement are provided in the VANET. First a pure wireless ad hoc network where vehicle to vehicle with any maintain of communications. Second is communication between the road side units (RSU), a fixed communications, and vehicle. Each node in VANET is prepared with two types of unit i.e. On Board Unit and Application Unit (AU). OBU has the communicational capability while AU execute the program making OBU‘s communicational capabilities. An RSU can be emotionally involved to the infrastructure network which is connected to the Internet. VANET differs from MANET in terms of high quality, dynamic topology, self-organized design, communication, path restrictions & topology size [1].DSDV is the mainly used protocol in VANET that is self organize dynamic in environmentthough there are everyday issues in DSDV like high Packet loss, low output and Packet delivery quantitative relation. To reinforce the Performance of DSDV in VANETs frequent optimizations techniques is often applied. This paper projected for resolution the best path routing drawback development genetic algorithmic rule that improve the performance of DSDV. Genetic algorithmic rule may be a training ways and examination of disadvantage resolution methodology. The genetic algorithmic rule then evaluates every applicant to fitness perform. This algorithmic rule is better of the looking algorithmic rule.

## 2. DESTINATION-SEQUENCED DISTANCE VECTOR (DSDV) PROTOCOL
To planned routing technique allows a group of mobile computers, which may not be close to any base station and can switch over data along shifting and subjective paths of interconnection, to manage to pay for all computers among their number a (possibly multi-hop) path along which data can be exchanged. In adding together, the solution must stay well-matched with operation in cases where a base station is available. Each routing table, at all of the station, lists all accessible destinations, and the number of hops to each. Each route table entry is tagged with a progression number which is originated by the objective station. To sustain the reliability of routing tables in an animatedly changeable topology, each station sometimes transmits updates, and transmits updates instantly when important new information is available. Routing in sequence is advertised by dissemination or multicasting the packets which are transmit occasionally and incrementally as topological change are detect for illustration, when stations move within the network. Data is also reserved about the distance end to end of time between entrance of the first and the arrival of the best route for each exacting destination. Based on this data, a choice may be made to delay promotion routes which are regarding to modify quickly, thus damp fluctuations of the route tables. The announcement of routes which may not have stabilized yet is postponed in order to reduce the number of re-broadcasts of possible route entries that in general arrive with the same succession number.The DSDV protocol requires each mobile station to advertise, to each of its existing neighbors, its individualdirection-finding table (for instance, by broadcasting its entries). The entries in this list may change fairly energetically over time, so the commercial must be made frequently enough to ensure that each portable PC can approximately forever stablish all other mobile computer of the collection[2]. All the computers interoperating to create data paths between themselves broadcast the essential data periodically, say once every few seconds. In a wireless intermediate, it is significant to keep in mind that broadcasts are limited in range by the physical distinctiveness of the intermediate. This is dissimilar than the condition with wired media, which frequently have a much more precise range of response.

## 3. RELATED WORK
Enhancement has been absolute to get better the routing protocols. These enhancements are through on the origin of VANET parameters to get better the performance of DSDV. DSDV protocols are calculated to supply the preferred route to be recognized. The real time applications focus on the Simulation parameters such as End to End Delay, Throughput and Packet Delivery Ratio. Presents the execution and investigate the presentation of DSDV in VANET with high opinion to a variety of parameters like Throughput, Packet size, Packet drops, and End to End delay and so on in three dissimilar scenarios of node concentration. For this MOVE is used along with NS2 and

SUMO. Then graphs are plotted using Trace graph for evaluation [3]. Comparative study of all the presented enhanced DSDV routing protocols using different presentation metrics and then create that the enhanced DSDV protocols performed not enough for some of the performance metrics[4].Presents a routing protocol for mobile ad hoc network using genetic algorithm. The planned scheme for genetic algorithm to find the optimal path from source and objective node. The genetic algorithm then calculates each candidate to robustnessmeaning. In this paper, replication is based on two different routing technique in MANET using simple or established DSDV routing and an improved routing using Genetic Algorithm (GA) method, and consequences shows that DSDV using GA have better performance than traditional routing.

# 4. PROBLEM FORMULATION

Execute*Destination-Sequenced Distance Vector* (DSDV) exploitationwith Genetic Algorithm (GA)

- To implement DSDV with GA
- To increase the output by increasing the throughput, packet delivery ratio.
- To decrease the End to End Delay.
- To evaluate the projected system.

# 5. GENETIC ALGORITHM

Genetic algorithm (GA) is a subclass of evolutionary algorithms (EA) which produce solutions to optimization problems using technique stimulated by normal development such as selection, intersect and mutation. The genetic algorithmic rules then estimate every candidate to fitness n and then perform crossover and mutation to find optimal path.

A Genetic Algorithm Requires:

- A genetic representation of the solution domain.
- A fitness function to evaluate the solution domain

## 5.1 Genetic Algorithm for Ad Hoc Network

Genetic algorithm for ad hoc system worked as an associated chart with nodes. The optimization is the cost of path among nodes. The goal of algorithm has to locate the shortest path with smallest amount cost involving source and destination nodes.

### *5.1.1 Demonstration of a Chromosome*

A chromosome corresponds to promising explanation of the optimization problem. Every chromosome represents a path consist of succession of constructive numeral that ID.

### *5.1.2 Assessment of Fitness Function*

The fitness function translating the chromosome in conditions of corporal denoted and assess of fitness based problem solution. The fitness functions in the shortest path routing problem to discover the least cost path and fitness of bandwidth.

### *5.1.3 Assortment of Best Fit*

The assortment process of the best fit is to get better the standard quality of the selection. The selecting persons from the population. There are two basic types of selection process.

1. Proportionate.
2. Ordinal-based selection.

Proportionate selection is chromosome based on their fitness values to the fitness of the other chromosomes in the population.Ordinal - based selection scheme select chromosome based not their fitness. The chromosomes are ranked by according to the fitness values.

### *5.1.4 Crossover*

Crossover process of two mating solutions and exchanging data among them finding new solutions. Crossover is performed on strings using medium crossover. The crossover process of genetic algorithm is based on swap over between two chromosomes of predetermined length.

Parent 1 11 000 ------- 11 111 child 1

Parent 2 10 111 ------- 10 000 child 2

Crossover operator

### *5.1.5 Mutation*

The mutation operativeaimlesslyalters genes to moderatelytransfer the look for to new locations in the solution pace.

0000 ------ 0001

## 5.2 Algorithm

The aim of this work is improving the quality of service of DSDV Routing Protocol with Genetic Algorithm the following steps are carried out.

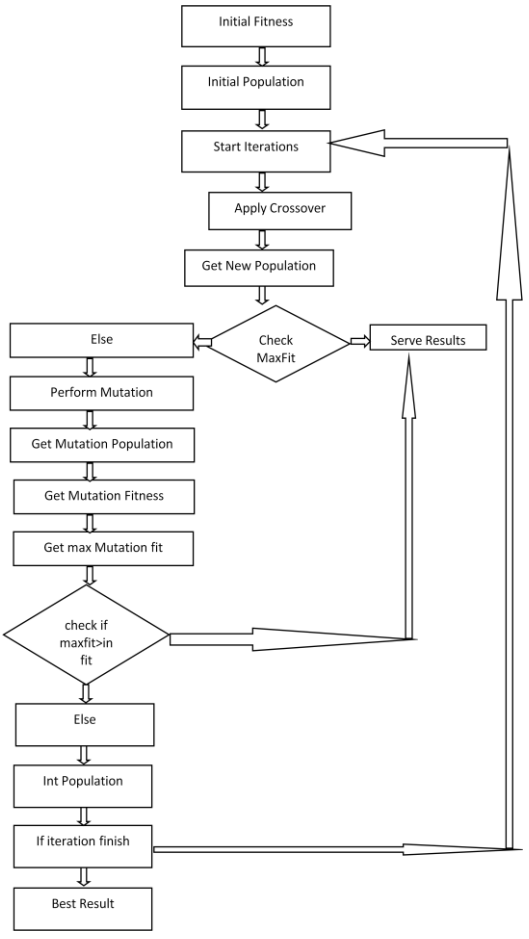


**Fig1: Genetic Algorithm Flow Chart**

# 6. SIMULATION AND PERFORMANCE STUDY

In this section, to analyses the presentation of the algorithmic rule.

## 6.1 SIMULATION PARAMETERS

**Table 1: Simulation Parameters**

| Parameter Type | Value |
|---|---|
| Network Simulator | NS-2.35 |
| Routing Protocol | DSDV |
| Simulation Time | 500ms |
| Simulation Area | 1000 * 1000 m |
| Number of Nodes | 50 |
| MAC Protocol | IEEE802.11 |
| Channel Type | Wireless Channel |
| Antenna Type | Omni Antenna |

## 6.2 Simulation Analysis

### *6.2.1 Throughput*

Throughput is the number of successfully received packets in a unit time and it is represented in bps. Throughput is calculated using awk script which processes the trace file and produces the result.

- Throughput:

$$TP = \left(\frac{Receive\ Size}{Stop\ Time - Start\ time}\right) X\ 8/1000$$

**DSDV (Before GA)**

**TP = 470.18**

**DSDV (After GA)**

**TP = 512.80**

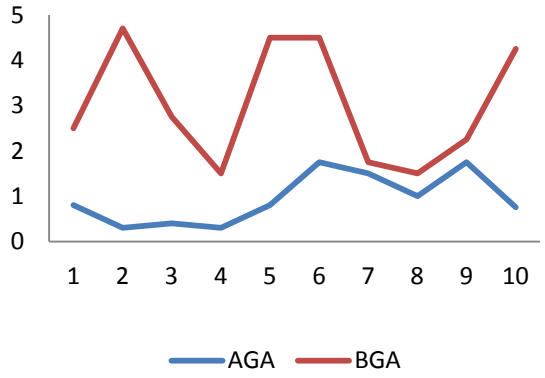


**Fig2: Throughput of DSDV**

### *6.2.2 End to End Delay*

End to End Delay is the average time full by a data packet to reach the target in the destination. It also includes the delay caused by route finding process and the line in data packet communication. Only the data packets that productively delivered to destinations that counted.

- End to End Delay:

EED = Receive Packet Time - Send Packet time

DSDV (Before GA)

**EED = 204.202ms**

**DSDV (After GA)**

**EED = 192.20ms**

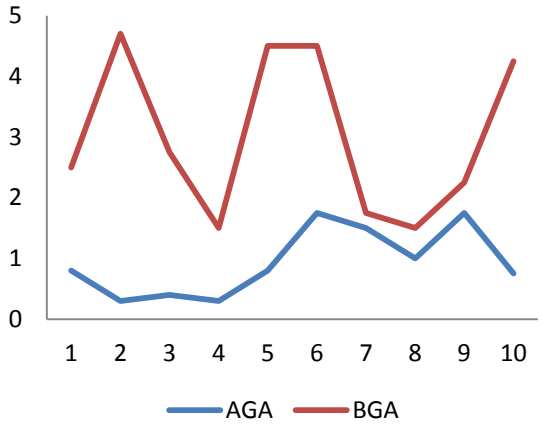


**Fig3: EED for DSDV**

### *6.2.3 Packet Delivery Ratio:*

The Ratio of the number of Packet Delivered data packet to the destination This illustrates the level of delivered data to the destination.

PDR= ∑ Number of Packet Receive / ∑ Number of Packet Send

**DSDV (Before GA)**

Ratio: 98.45%

**DSDV (After GA)**

Ratio : 99.56 %

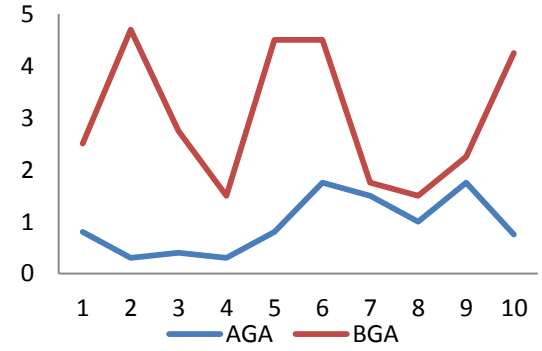


**Fig4: PDR for DSDV**

## 6.3 Simulation Result Analysis

The circumstances used in the simulation construct the 50 nodes and 5 malicious nodes under the area of network and specifies the source and destination node. In this work,

tocivilizing the DSDV with Genetic Algorithm to get better the quality of service (QoS) and performance. In the graphical representation, BLUE graph line shows for simple DSDV and RED graph line shows for Genetic DSDV. The graphs shown below of throughput, packet delivery ratio, packet loss of Genetic DSDV are better than simple DSDV.

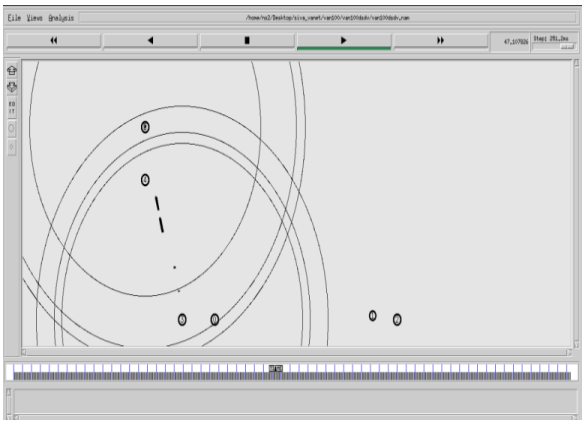

**Fig5: Throughput DSDV**

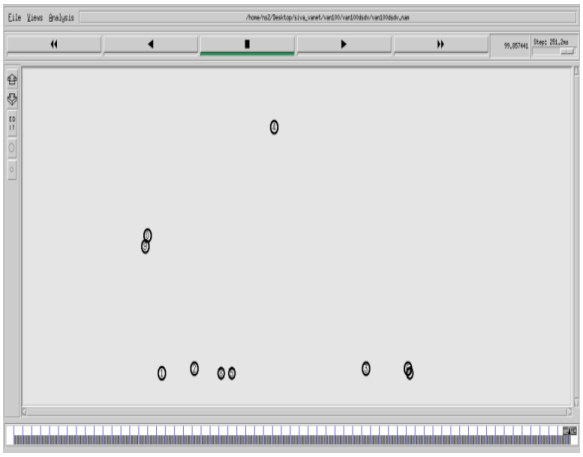

**Fig6: PDR DSDV**

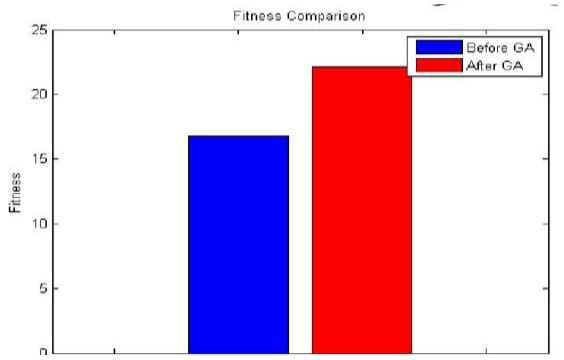


**Fig7: Comparison of Before GA & After GA**

### *6.3.1 Throughput*

Throughput is the calculate of how speedy to send packets through network. The number of packets delivered to the receiver provides the throughput of the network. The throughput is define as the total amount of data a receiver actually receives from the sender divided by the time it takes for receiver torget the last packet.

### *6.3.2 Packet Delivery Ratio*

The Ratio of the data packets delivered to the destinations to those generated by the CBR sources. It is the fraction of packets send by the application that are received by the receivers.

### *6.3.3 End to End Delay*

End to End Delay is the failure of one or more transmitted packet to arrive at their destination.In the above bar graph representation BLUE color represents the output of DSDV before GA and RED color represents the DSDV after GA. Results shows that the performance of DSDV with generic algorithm (GA) is batter then DSDV without Genetic Algorithm (GA).

## 7. CONCLUSION

VANET (Vehicular Ad-hoc Network) is a new knowledge which has taken massiveconsideration in the recent years. It is the extraordinary type of MANET which has the high mobility, self-organized, dynamic in nature. In this, Vehicles act as nodes to share data. The basic task of VANET is to provide information about Traffic- jams, Road-Blockage and efficient path which decrease the time of traveler. To accomplish these objectives, algorithms must be efficient. In this research, Genetic algorithm is used to improve the effectiveness and quality service of DSDV. Firstly, some scenarios are generated then GA is to be applied on DSDV. The research concludes that Genetic DSDV is superior to simple DSDV; this conclusion is made on the basis of some parameters like throughput, End to End Delay, packet delivery ratio. In Future to research other Routing Protocols like DSR, TORA with Genetic Algorithm. And in this paper only one optimization technique has been used, but this work can be optimized in future by using more than one optimization technique.

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