[Kumar*, 5(5): May, 2016] ISSN: 2277-9655
Impact Factor: 3.785

IJESRT
INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

PATH PLANNING STRATEGY AND DETECTION OF INTRUDER IN VANET USING REAL TIME TRANSPORTATION SYSTEM

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DOI: 10.5281/zenodo.51548

ABSTRACT
In this paper, we suggest a real-time path-planning algorithm to improve the overall spatial consumption of a network which reduces average travel cost for avoiding collision in congested traffic. Real-time path planning can adroitly lessen traffic jamming in metropolitan cities. However, designing a well-organized path-planning algorithm to achieve a worldwide best vehicle traffic control still remains a difficult problem. The Vehicular Ad-Hoc Network applications work on the principle of periodic exchange of messages between each vehicle. A malicious vehicle can disseminate false traffic information in order to force other user vehicles to take incorrect decisions by creating multiple virtual identities using different forged positions. Both network spatial utilization and travel cost are considered to optimally balance the overall network smoothness and the driver's preferences. More importantly, Road-Side-Unit's in VANETs can greatly enhance the timeliness of data collection and dissemination, which makes it possible to perform coordinated path-planning for a group of vehicles. The traffic signal controller reduces the waiting time of vehicles from RSU. In further modification, it detects the position of forging attacks occurring on VANET thereby providing security to passengers. Secret key of each vehicle is changed when entering from one network to the other. The server assigns a master key for all emergency vehicle which has high priority in the network-to-network movement.

KEYWORDS: VANET, node, Road side Unit, Network head, Master Key.

INTRODUCTION
In recent times Vehicular Ad hoc Networks have received considerable awareness. The VANETs provides both Roadside-to-Vehicle Communication and Inter-Vehicle Communication capability. IVC works like a multi-hop Mobile Ad hoc Network. In traditional VANET architectures, nodes are all treated equally and may take part in packet forwarding. However, vehicles are dissimilar in reality. Some vehicles are not willing to forward packets for others, and their wireless devices might be shut down by the driver at any time. Another feature of VANETs is that traffic lights have great influence on the vehicular movement, so vehicles are moving like clusters. These features should be considered in the VANET architecture design.

ROUTING ALGORITHM
The data delivery ratio can be increased only by long link duration between the vehicle-to-vehicle communication (V-V) or between vehicles and Road Side Unit communication (V-R). In real time, the vehicles travel with different mobility, so we propose Location based Multipath Flooding (LMF) algorithm. This implementation of algorithm can be seen using ns2 simulation software by showing graphs with various coordinates. There are 3 ways by which the network link can be prolonged:

1) Selection of ideal path with minimal congestion
2) Regular updation of data to the server or cluster regarding the routing.
3) To maintain an average speed when passing different nodes.

2.1 Path Planning Algorithm
The path-planning algorithm can be used to avoid congestion of traffic in the urban scenarios. However, designing the vehicle traffic control systems globally still remains a challenge. The Hybrid Intelligent transportation system (ITS) utilizes the cellular systems of public transportation systems and both vehicular ad-hoc networks for enabling the real

time communications between vehicles, road side unit and vehicle traffic server effectively. The real time path planning algorithm improves the entire spatial utilization of the road network, reduces the travel cost of vehicles by not getting stuck in congestion.

2.2Path Planning strategy

The graph theory defines the shortest path-planning problem, where the shortest path between two nodes is taken from the graph with nodes and arcs.

The route planning algorithm uses the best search to find the shortest path from the graph and as traverses, the lowest heuristic cost path also by keeping the alternate path segments in a hierarchical flow depending on the above requirements or criteria.

2.3Fast Randomizing Algorithm

This algorithm is deployed in the cases where there is no proper output or where the random sequence does not follow a predictable pattern to determine the output. But, in some cases the uniform inputs are fetched instead of random sequence, to direct its behaviour uniformly. On hoping, that will give a high efficient output. This algorithm works perfectly and its performance can be evaluated when the inputs are random variables, where the output sequence is random too. There are two types of fast randomizing algorithm, an algorithm that returns a correct result irrespective of the inputs bits fetched to a system within the stipulated time is called Las Vegas algorithm. An algorithm has a chance of producing false result depending on the input variable to the system is called Monte carlo algorithm .One has to analyse the algorithm before deploying it to reduce the run time or memory usage.

INTRUDER IDENTIFICATION SYSTEM

Intrusion detection is a set of techniques and methods that are used to detect suspicious activity at the network level. Intrusion identification systems fall into two basic categories: signature-based intrusion identification systems and anomaly identification systems. Intruders have secret keys like computer viruses, that can be detected using software. IIS tries to find data packets that contain any known intrusion-related keys or anomalies related to Internet protocols. Based upon a set of signatures and rules, the detection system is able to find and log suspicious activity and generate alerts. Anomaly based intrusion identification usually depends on packet anomalies present in protocol header parts. In few cases these methods generate improved results compared to signature-based method. Usually an intrusion identification system captures data from the network and applies its rules to that data or detects anomalies in it. Network IIS (NIIS) are intrusion identification systems that capture data packets traveling on the network media and match them to a database of secret keys. Depending upon whether a packet is matched with an intruder signature, an alert is generated or the packet is logged to a file or database.

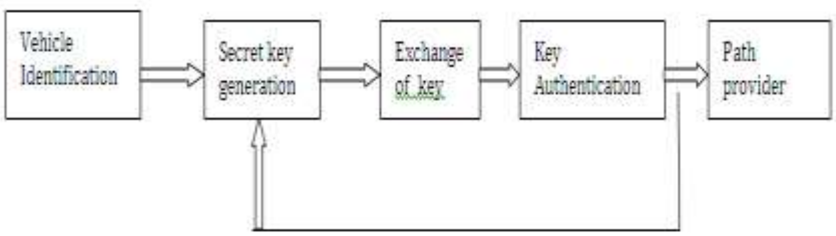

Fig.1 Intruder Identification System

DESIGN OF THE SYSTEM

The format for recording the vehicle's driving information, the mechanism to distribute real time traffic information among contacted vehicles through VANET and the flow to estimate the real time traffic information system of next time zone are first described. Later, based on traffic information distributed among vehicles and accessed from Google Maps, the two versions of modified route planning algorithms are proposed for meeting the shortest travelling time and the lowest fuel consumption criteria.

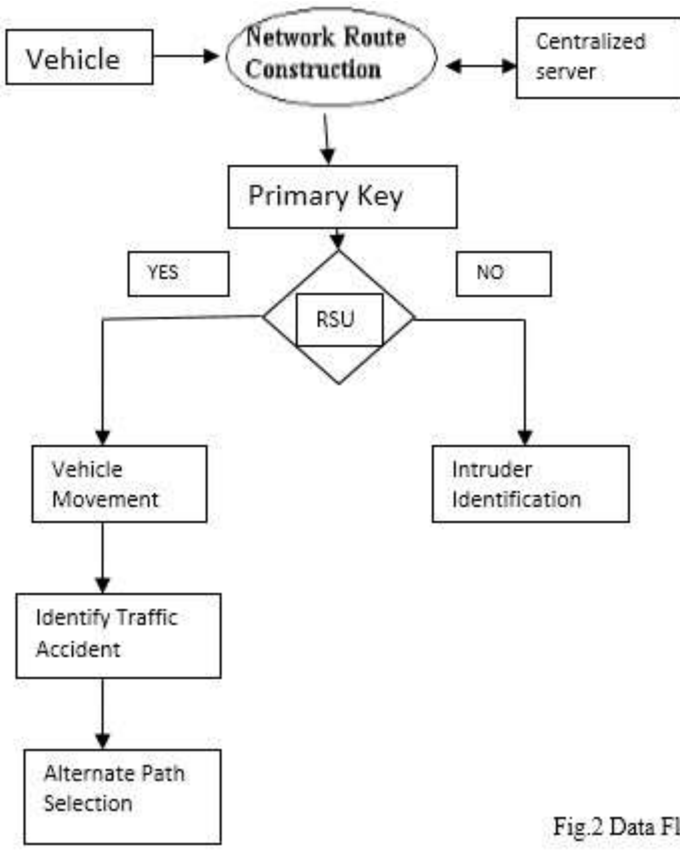

Fig.2 Data Flow Graph

TRAFFIC DISTRIBUTION AND ESTIMATION

The Road side unit acts as a wireless LAN access point and enables vehicles within its wireless transmission range to communicate with devices in the network infrastructure. The two traffic information sources are the On-board GPS device and the electronic road database allowing the vehicle to identify its current GPS location and record information such as the instantaneous driving speed in is memory when the vehicle starts to drive on the road.

The vehicle's On-board unit's GPS device detects whether it has passed through an intersection that indicates an end of the road segment. If it has, all recorded driving speeds are averages and stores in Average Speed field of the three field format for traffic information of the three field format for traffic information of this road segment with correct values in Road Segment ID and Record Time Fields which specifies the time of a vehicle leaving the road segment.

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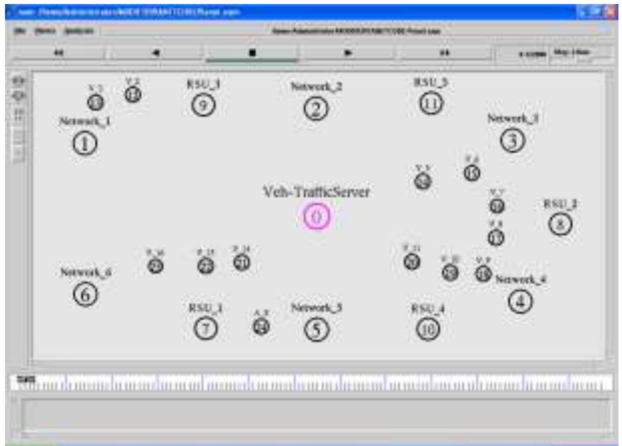

Fig.3 Vehicle Identification

When the vehicle is within the wireless communication range of an RSU, it can access the real time and historic traffic information from Google Maps as the second source via RSU. An hour is divided into 4 time zones by the Google Maps and each time zone lasts for 15 minutes. The different colors used to represent four different driving speeds such as green means fast, yellow for modest, red for slow and re-black for congested. Google maps provide instant traffic information in urban areas, on major roads and highways. The Google Maps information is combined with the proposed VANET traffic information server therefore, the two traffic sources are aggregated to supply sufficient traffic information for the path-planning algorithm. The outcome of the planned route is more accurate and reliable for navigation when compared to traditional planned routes.

→ The traffic information distribution mechanism through VANET

The vehicle collects the traffic information continuously as it drives on the road, when another vehicle enters the wireless transmission range i.e. IEEE 802.11p, of another vehicle through the traffic information server.

→Shortest travelling time criterion

The travelling time of road segment is calculated by dividing its length over its average driving speed for time zone. The heuristic function in the original is replaced by the second term to find a neighbor node that has the minimum value when compared to all the other neighbor node of the current node.

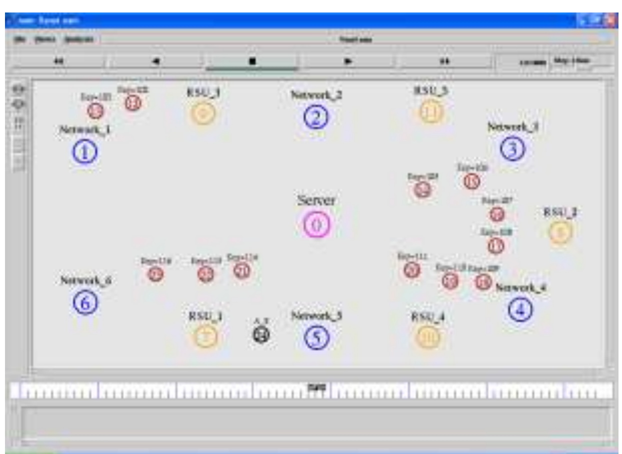

Fig.4 Master Key generation

→Lowest fuel consumption criterion

The sum of amount of fuel consumed on each road segment that the vehicle has passed from the starting node to the current node. The amount of fuel consumed in road segment is equal to the product of its length and the fuel consumption per kilometer, which is a function of its average driving speed for time zone. Later, the heuristic function in the original is updated as second term to find a neighbor node that has the amount of consumed fuel for the second term among all neighbor nodes of current node.

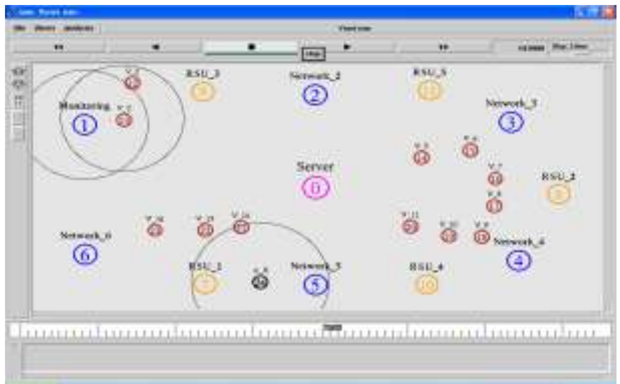

Fig.5 Exchange of key information

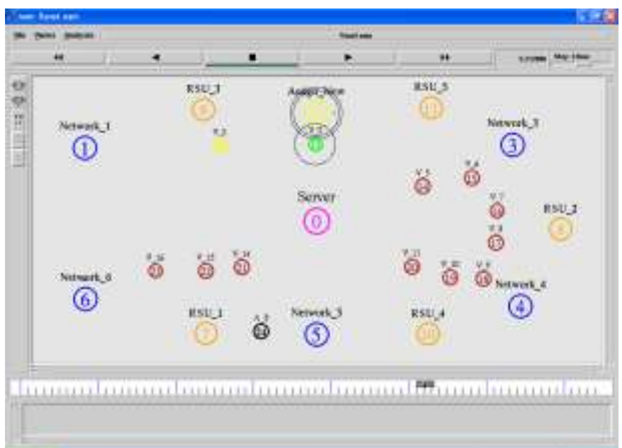

Fig.6 Path Identification and Monitoring

SIMULATION OF PATH PLANNING

In the distributed path planning, every individual vehicle identified a new path based on the well known information of accidents when it receives any information on overcrowding or accidents but either with coordination among vehicles or considering the cost of path planning.

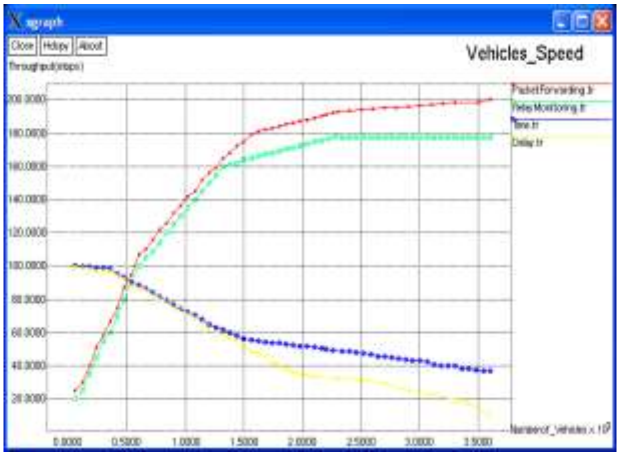

Fig 7 Vehicle speed graph

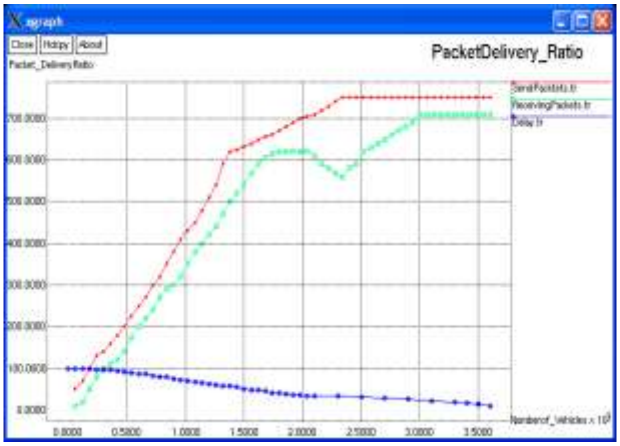

Fig.8 Packet delivery ratio graph

CONCLUSION

In this paper, the proposed hybrid-VANET-enhanced real-time path planning for vehicles to avoid congestion in the network. We first propose a VANET-enhanced framework with functionalities of real-time traffic information collection, involving both vehicle to vehicle and Vehicle to Roadside unit communications in public transportation system. Then, a globally optimal real-time path-planning algorithm is considered to advance overall spatial utilization and reduce average vehicle travel cost by means of optimization. Extensive simulations have been conducted to display that the proposed path-planning algorithm can achieve superior performance than that without real-time path planning and the adaptability to different accident duration and traffic densities. In future work, we plan to find large-scale real-world vehicle traffic traces to further validate benefits of the proposed algorithm in practical scenarios.

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