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An Optimal Technique in VANET Routing Using Metaheuristic Approach

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Abstract*— VANET systems are more dense and it supposed to handle high traffic rate as well as frequent interrupt in connection. It should consume less power and utilize bandwidth efficiently. In VANET system Vehicles need to communicate with the other node, for that node continuously sending RTS-CTS signals. As if number of signals increases, there is high probability of collision. Collision damages data packets .so it requires retransmission, in this we use different routing protocols through which overhead can be reduced.

***Keywords*— VANET (Vehicular Ad-hoc Network), MANET (Mobile Ad-hoc Network), wireless networks, shapley centrality, Ant Colony Optimization**.

I. INTRODUCTION

A Vehicular Ad-Hoc network is a form of Mobile ad-hoc Networks, to provide communication among nearby vehicles and between vehicles and nearby fixed equipment i.e. roadside equipment. The main goal of VANET is providing safety and comfort for passengers. Each vehicle equipped with VANET device will be a node in the Ad-hoc network and can receive & relay other messages through the wireless network. Collision warning, Road signal arms and in place traffic view will give the driver essential tool to decide the best path along the way.[8]VANET or Intelligent Vehicular Ad-Hoc Networking provides an intelligent way of using vehicular Networking. VANETs comprise of radio-enabled vehicles which act as mobile node as well as routers for other nodes.The growing demand of wireless devices and wireless communication tends to research on self-curing and self organizing networks without the support of any centralized management or pre-demonstrated authority/infrastructure. This kind of networks is known as Ad hoc networks.[25]With the sharp increase of vehicles on roads in the recent years, driving becomes more challenging and dangerous. Roads are saturated; safety distance and reasonable speeds are hardly respected. The leading car manufacturer decided to jointly work with govt. agencies to develop solution aimed at helping drivers on the roads by anticipating hazardous events or bad traffic areas. VANETs comprise of radio-enabled vehicles which act as mobile node as well as routers for other nodes.

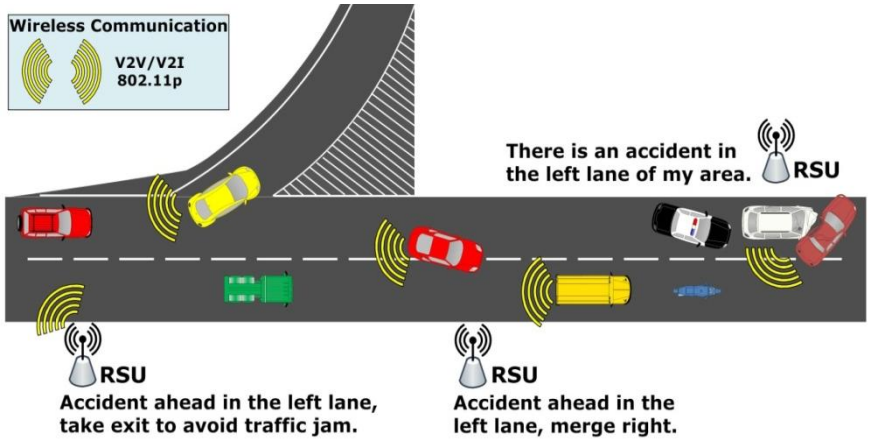

Fig.1. This figure shows the communication scenario among vehicles and road side units using VANET

II. RELATED WORK

Zhu.H, Dong.M[1] presented an Vehicular networks consist of highly mobile vehicles communications, where connectivity is intermittent. Due to the distributed and highly dynamic nature of vehicular network, we propose an innovative scheme, named ZOOM, which automatically choose the most appropriate mobility information when deciding next data--relays in order to minimize the end--to--end delay. Our algorithm uses locally collected contacts to predict the future contact opportunities between vehicles. Khekare.G, Sakhare.A[3] shifting focus towards improving the onroad safety rather than improving the quality of the roads. It introduces a smart city framework i.e. Intelligent Traffic Lights (ITLs) that transmit information about traffic conditions that will help the driver to take appropriate decisions.Zhou.H,

Huang.L[4] To increase the security in VANET, heuristic ant colony optimization is introduced with few known opponents and with unknown opponents. Vehicular Communications (VC) aspire to improve safety and efficiency of transportation systems. The factor centrality measure taken as input and evaluated by aligning centrality metrics to the conventional road model derived by road segmentsSehgal.J, Arora.P[8] presenting an intelligent route identification approach in case of accident occurrence for V2V communication. The intelligent vehicles are been defined respective to distance, direction and speed analysis. In this paper we conclude that the ant colony optimization is efficient approach for VANET. The accident information is exchanged between the road side sensors using WIMAXXu.S, Guo.P, Xu.B[10] Traffic jams and traffic accidents have become a major concern in current society. VANET (vehicle adhoc network) is an emerging attractive application to solve such problems. Quality of service (QoS) in VANET becomes a hot topic own to its increasing challenge. The main goal of this paper is to analyze the main quality criteria among popular routing protocols with an integrated VANET test bed.Balmahoon.R, Peplow.R[14] Vehicular Ad-Hoc Networks (VANETs) is an application of MANETs that allows for communication between road transport vehicles and promotes safety on roads. There are however situations that could cause harm to the vehicle and its occupants; vehicles could be tracked, followed or have their messages monitored. A method to protect the vehicle is to ensure it remains anonymous. This refers to privacy, i.e. hiding the vehicle's real identity. This paper provides an introduction to VANETs and puts into context authentication and privacy in VANETs.Zhu.Y, Shi.X, Wang.Y[11] Delay tolerant networks (DTNs) may lack continuous network connectivity. Routing in DTNs is thus challenging since it must handle network partitioning, long delays, and dynamic topology in such networks. In this article, we summarize the social properties in DTNs, and provide a survey of recent social-based DTN routing approaches. To improve routing performance, these methods take social characteristics such as community and friendship to assist packet.Moreira.W, Mendes.P[12] Opportunistic routing is investigated to enable the proliferation of low-cost wireless applications. To have a better picture of social structures, social-based opportunistic routing solutions should consider the dynamism of users behavior resulting from their daily routines. We address this challenge by presenting dLife, a routing algorithm able to capture the dynamics of the network represented by time-evolving social ties between pair of nodes.

III. PROPOSED WORK

VANET routing by community of nodes according to it social information in network and shortest path which optimize the social information(network connectivity) by metaheuristic approach(Ant Colony Optimization).In VANET, Metaheuristic approach is ACO(Ant Colony Optimization).The Ant Colony Optimization algorithm(ACO) is a probabilistic technique for solving computational problems which can be reduced to finding good paths through graphs.In this dissertation, we investigate optimality by considering four parameters: the data lost or dropped during routing, the throughput, delay and overhead.

IV. RESEARCH METHODOLOGY

- Dijkstra's algorithmis used to find the shortest path.
- The concept of Centrality is used to describe network connectivity.

One Simulator

It stands for Opportunistic Network Environment simulator. A new simulation environment that combines movement modeling, routing simulation, visualization in one program. Movement modeling can be done either on-demand using the integrated movement models or movement data can be imported from an external source.

The core of the ONE is an agent-based discrete event simulator. To make it suitable and efficient enough for simultaneous movement and routing simulation, it uses time slicing approach so the simulation time is divided in fixed time steps. All movement models, report modules, routing algorithms and event generators are dynamically loaded into the simulator.

V. CONCLUSION

Centrality is used to identify which nodes are in the 'center' of the network. This term describe the network connectivity in optimal manner. Dijkstra's algorithm is used to find the shortest path between vehicular nodes.

In the Heuristic-based Ant Colony Optimization technique(HACO), vehicular nodes acting in a same manner with each other, send out ants depositing information i.e. pheromone concerning the maliciousness of further nodes. Then, a node generates the authenticity of the other node following apheromone guideline process and hence collecting all information accessible to the network enchanting an informed choice in an optimized manner.

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