Improving Communications in Obstacles by Hybrid Mode Communications

S.RAJESHWARI [1], P.MALLIKA [2], D.GOKILA [3], M.ARUNKUMAR [4], T.SEENIVASAN [5]

Abstract - A Vehicular Ad-Hoc Network or VANET is a equipment that uses poignant vans as nodes in a network. VANET turns each participating van into a wireless router or nodule, allowing vans roughly 100 to 200 meters of each other to tie and, in turn, creates a network with an ample assortment. As vans plunge out of the indication assortment and plummet out of the network, other vans can unite in, involving vehicles to one another. It is predictable that the first systems that will integrate this technology are police and fire vehicles to communicate with each other for safety purposes. The system proposes a model that satisfies all of these requirements regarding vehicle communication with multiple obstacles. By introducing the Vehicle to infrastructure Communication, the obstacle vehicles blocking the communication can be left as such and the infrastructure is used for successful communications. Most of the concerns of interest to MANets are of interest in VANets, but the details differ. The proposed model vehicles as obstacles and takes into account their impact on the LOS obstruction, received signal power, and the packet reception rate.

Keywords - Geocast routing protocol, mixed mode communication, LOS-Line of sight, Path selection.

I. INTRODUCTION

Hybrid mode communication is the message pattern projected for a quantity of traffic refuge, traffic custody, and infotainment applications. In hybrid mode communication, due to the fairly low altitude of the antennas on the communicating vehicles, it is practical to be expecting that other vehicles will act as obstacles to the hint, simulation environments. Here Hybrid mode communication means combination of vehicle-to vehicle (V2V) and vehicle-to infrastructure (V2I) communication.

VANET is a budding knowledge to accomplish bright inter-vehicle communications, faultless internet connectivity resulting in better road safety, essential alerts and accessing comforts and entertainments. The technology integrates WLAN cellular and Ad Hoc networks to achieve the incessant connectivity. The feature of VANET typically the operation technology of MANET in the sense that the process of self-organization, self-management, low bandwidth and shared radio diffusion criteria remain same. This suggested that the design of able routing protocol weight up gradation of MANET architecture to contain the speedy mobility of the VANET nodes in a well-organized manner. The defensible various research challenges to design proper routing protocol. This stage is important to reiterate the key point of VANET that may be accounted for the plan of various routing protocols. In vehicle-to-vehicle communications, vehicles communicate with each other without support from the infrastructure. Vehicles communicate with each other when they are covered within the same radio range, or multiple hop relay via other vehicles is possible. The vehicle to transportation communication case, vehicles communicate with each other with the support of infrastructure such as roadside wireless entree points. Vehicles may also communicate with the infrastructure only. Hybrid mode safety communication may include collision caution, road obstacle counsel, cooperative driving, junction collision warning, and lane change assistance vehicle-to-infrastructure safety communication may include hidden driveway warning, electronic road signs, traffic circle collision warning, railroad crossing warning, work zone forewarning, highway merge assistance, and robotic driving.

II. RELATED WORKS

The hybrid mode communication is based on the following proposition: the low elevation of the antennas in hybrid mode communication coordination suggests that other vehicles can act as obstacles for signal broadcast, most notably by obstructing the LOS between the communicating vehicles. Numerous studies, both investigational and logical, have shown that LOS and non-LOS (NLOS) scenarios must be alone modeled in VANETs, because, the resulting channel individuality are primarily different. Several other experimental studies point out that additional vehicle a part from the spreader and receiver could be an imperative factor for the indication circulation and therefore should be included in modeling. The state of the art in hybrid mode channel is analyzed, precise and modeled. Based on the approach of modeling the surroundings geometrically, and the circulation of objects in the environment.

We present an overview by using these models of the existing research on hybrid mode communication and channel modeling with respect to vehicles as obstacles.

III. WORK FLOW

In proposed algorithm consists of four parts: the purpose of beacon message, the strategy in straight roads, the strategy at the traffic circles, and the recovery strategy when the algorithm fails.

A. Beacon Message

Each vehicle broadcasts beacon messages every so often to gain the in order of the adjacent vehicles. Therefore, the beacon message includes the location, speed and bearing acquired from GPS. The way to get hold of the velocity and direction will be illustrated. Also, all means of transportation can use beacon messages to maintain one-hop fellow citizen list. There are five cars in the figure: vehicle A, B, C, D, and E. After broadcasting the beacon message, vehicle C shows up in vehicle A, B, D and E's neighbor list tables, and vehicles A, B, D and E show up in vehicle C's neighbor list table. Therefore, each vehicle uses beacon messages to uphold its own neighbor in a city scenario, it is important to know how to onward in rank to different roads by vehicles at the traffic circles will give two more examples to introduce how vehicles know they are at the traffic circles. With the beacon messages broadcaster by all vehicles, every vehicle can launch its own neighbor list table, and know whether it is the arranger or not. Next, we use two examples to introduce how vehicles ascertain if they are at the traffic circles. Fig 1 shows the vehicle to infrastructure communication. There are four neighbors in vehicle C's neighbor list table: vehicle A, B, D and E. The comparative coordinates are compared and it can be known that vehicle C is at the traffic circle. Additionally, to compare vehicle A, B and C's neighbor list tables, we find that vehicle A and B exist in the vehicle C. However, vehicle A and B do not show up in each other's neighbor list table. Thus, it can be contingent that the signals are obstructed by obstacles or buildings between vehicle A and B and vehicle A and B are on different roads. Consequently, vehicle C that is in the coverage of vehicle A and B is very possibly at the traffic circle. In this paper, we assume that each vehicle can judge whether they are at the traffic circles. When a vehicle knows that it is located at a traffic circle, it broadcasts a beacon communication to inform the neighboring vehicles.

B. Straight Road

On a straight road, adaptive virtual queue (AVQ) algorithm is our chosen strategy. The dissimilarity between our proposed adaptive virtual queues (AVQ) is that we use the notion of vector to choose the after that hop so that the precision can be superior. In this paper, the approach is called virtual queue. In virtual queue, while receiving the container that desires to be forwarded to the intention, the vehicle takes itself as the midpoint of match up axis and calculates the vector from itself to the destination. After that, the vehicle starts to compute the vectors of all vehicles in the diffusion variety and figures out which vehicle is the nearby to the destination. In our description, the vector of the vehicles on the right side of the center is plus and that on the left side is minus. Vehicle A receives a container that wants to be forwarded to the destination vehicle D. To decide the next hop, vehicle A first compares whether the vector of vehicle A is shut to that of vehicle D. Thus, vehicle B directly roads, the packet will be forwarded in the same way. After receiving the signal that there is a coordinator ahead, virtual queue will change to predictive mode, which will be further illustrated in the next section.

c. Traffic circle

As beyond mentioned, we presume that a vehicle can adjudicator whether it is the director by beacon message When vehicle broadcasts the signal that it is a controller, the adjacent nodes will amend to prophetic mode to the association of the nodes, for example, vehicle C sends out

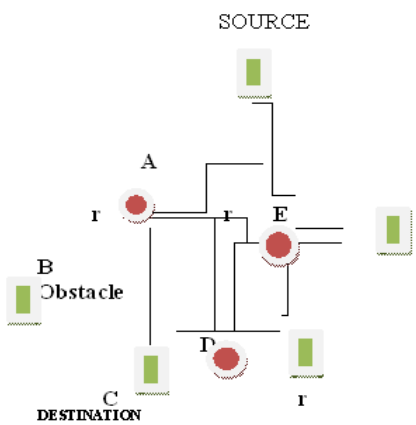

Fig a. Vehicle to Infrastructure Communication

signals to report to its neighbors that it is a coordinator and its neighbors will change to prognostic mode. Therefore, after receiving vehicle A's information, vehicle Predicts the other movements in predictive mode chooses the best vehicle to forward the path to vehicle D.

D. Recovery Strategy

Completely thwart vehicles from limited maximum and the recovery strategy is indisputably required. Thus, the right-hand rule is adopted to forward the packet to the traffic circle for the decision-making. The paradigm displays when vehicle S falls to local maximum, it will change to recuperation mode and use the right-hand rule to forward the packet to the traffic circle.

IV. ALGORITHMS

A. Geocast routing protocol

Geocast Routing Protocol: Geocast is a network protocol using environmental positions for addressing and direction-finding. It ropes the addressing of personality nodes and of geographical areas. Nucleus etiquette components of Geocast are beaconing, location service, and forwarding. With beaconing, nodes sporadically transmit short packets with their ID, current environmental position, speed and heading. The spot service resolves a node's ID to its current position based on a flooding request/reply method. Forwarding basically means relaying a packet towards the objective: Geographical Unicast provides packet convey between nodes via multiple wireless hops. Geographical Broadcast distributes data packets by optimized flooding, where nodes re-broadcast the packets if they are located in ecological area determined by the packet.

B. Path selection

Path selection involves applying a routing metric to various routes, in order to go for (or guess) the best route. In mainframe networking, the metric is computed by a routing algorithm, and can swathe in sequence such as bandwidth, network delay, hop count, path outlay, pack, MTU, steadfastness, and announcement cost. The steering table provisions only the paramount possible routes, while link-state or topological databases may store all other information as well. Because a routing metric is specific to a given routing protocol, multi-protocol routers must use some external heuristic in order to select between routes scholarly from different routing protocols. Cisco routers, for example, attribute a value known as the administrative remoteness to each route, where smaller directorial distances designate routes cultured from a supposedly more reliable protocol.

A local network supervisor, in singular cases, can set up host-specific routes to a finicky device which provides more control over system usage, permits testing and better overall refuge. This can come in handy when debugging network connections or routing tables. In this algorithm was used to select the vehicles in correct path.

V. SIMULATION RESULTS

This proposed work is developed using NS2 simulation. The NS2 was selected as the simulator in part because of the choice of skin it provides or partially because it has a release foundation code this can be adapted or complete.Ns2 is a discreet event simulator. It contains list of events and execute one after the other. It supports both wired and wireless. NS-2 is an open-source simulation tool running on Unix-like operating systems. NS-2 supports several algorithms in routing and queuing LAN routing and broadcasts are part of routing algorithms. Queuing algorithm includes fair queuing, deficit round robin and FIFO. It supports networking research and provides substantial support for simulation of routing, multicast protocols and IP protocols, such as UDP, TCP, RTP and wireless and satellite networks. The result shows the frequent transmission of data from one vehicle to another vehicle.

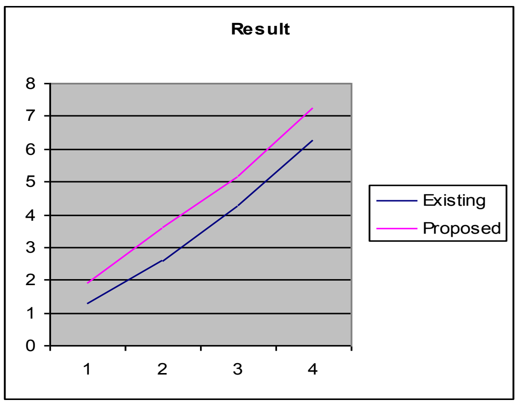

Fig b. Result analysis

The graph differentiates the communication between the vehicle in existing system and proposed system. In existing system the packet loss is occurred during transmission of data. In proposed system the packet loss has been reduced. Fig c. shows the packet loss of proposed system. The obstruction vehicle and non obstruction vehicle is shown in another graph.

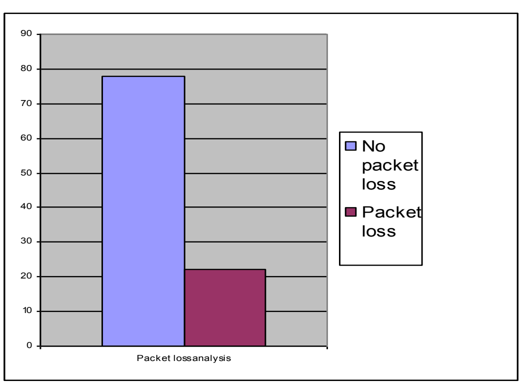

Fig c. Packet loss analysis

The non obstruction vehicle not affecting the transmission of data as packet. It is not communicating through non obstructing vehicle. It communicates through infrastructure like road side unit. The distance between vehicle and infrastructure is calculating and implementing communication through infrastructure. Reduce packet loss during transmission of data. Increased the life time and low computational cost.

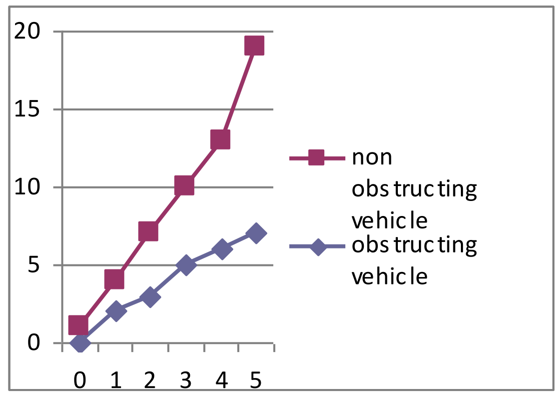

Fig d. secure data transmission

Fig d. shows the secure transmission between the vehicle to vehicle communication in existing and proposed system. The transmission flow is more secure in proposed system than the existing system.

VI CONCLUSIONS

The conclusion obtained by employing the proposed model show that significant contribution can be obtained with regards to the practical understanding and acceptance of the simulation results, at the same time increased the life time and low computational cost. The results also point out that the stochastic models that determine the overall, system-level additional attenuation due to vehicles are unable to adequately represent the impact of vehicles on the obtained signal power.

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S. RAJESHWARI received her B.E degree in Computer Science and Engineering from Sri Subramanya College of Engineering and Technology, palani in 2011 and M.E degree in Computer Science and Engineerin from Karpagam University, Coimbatore in 2013. She is currently working as an Assistant Professor in the department of Computer Science and Engineering at Jay Shriram Group of Institutions.

P.MALLIKA received her B.E degree in Computer Science and Engineering from Amrita Institute of technology & Science, Coimbatore in 2006 and M.E-Computer Science and Engineering degree from Maharaja Engineering College, Avinashi in 2013. She had industrial experience at Polaris Software Lab, Chennai as an associate consultant for three years and two years teaching experience at Angel College of Engineering & Technology, Tirupur. She is currently working as an Assistant Professor in the department of Computer Science and Engineering at Jay Shriram Group of Institutions.

D.GOKILA received her B.E degree in Computer Science and Engineering from Avinashilingam University for women, Coimbatore in 2010 and M.E-Software Engineering degree from Sri Ramakrishna Engineering College, Coimbatore in 2012. She had one year teaching experience at Jansons Institute of Technology, Coimbatore and currently working as an Assistant Professor in the department of Computer Science and Engineering at Jay Shriram Group of Institutions.

M.ARUNKUMAR received his B.E degree in Computer Science and Engineering from Maharaja Prithvi Engineering College, Avinasi in 2011 and M.E degree in Computer Science and Engineering from Nandha College of Technology, Perundurai in 2013. He is currently working as an Assistant Professor in the department of Computer Science and Engineering at Jay Shriram Group of Institutions.

T.SEENIVASAN received his B.E degree in Computer Science and Engineering from MPNMJ Engineering College, Chennimalai in 2008 and M.E-Computer Science and Engineering degree from Vellalar College of Engineering, Thindal in 2011. He had two years teaching experience at Professional Group of Institutions, Palladam. He is currently working as an Assistant Professor in the department of Computer Science and Engineering at Jay Shriram Group of Institutions.

