Efficient Routing in Vehicular Ad-hoc Networks Using Fisheye State Broadcasting

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Abstract— Vehicular Ad-hoc Network (VANET) is used to provide the efficient network environment for a large vehicle system in which the vehicle speed is very fast. We provide the transmission of safety and non-safety messages among vehicles. If the message is receiving in less time so that the drivers can take the effective decision. For this purpose efficient safety message technique is used that is FSR. This technique provides advantages of less control message exchange by abandoning the exhausted food source. A next forwarder is elected on the basis of fitness value and that node is the node in that region. Using this technique we can save the bandwidth. It is more efficient in high density network and also called as ABC based FSR.

Keywords— Artificial Bee Colony (ABC), Fisheye State Routing (FSR), Routing protocols

I. INTRODUCTION

The growth of the increased number of vehicles they communicate with other vehicles and they are creating a special class of wireless networks that is called as VANETs [1]. They are moving with very high speeds. It is to be considered as a infrastructure based and infrastructure less networks. They are different from other types of wireless specific networks such as Mobile Ad-hoc network (MANET), Wi-Fi (802.11e) and Wi-Max. However, ad hoc networks have different characteristics from VANETs networks, such as different in speed and frequently changes topology. Along with some useful applications provided by VANETs, one of the key challenges is to disseminate safety message among vehicles. The advancement of wireless technology is increased day by day so that the widely used applications having the low cost and powerful features.

Basically two types of networks are there in the environment. Wired network in which the nodes are connected with each other with the help of any wire or cable and this network have unique characteristics. But the mobile network may have the frequent topology changes. The wireless network has no link between the wireless devices so that high rate of error in the network and limited bandwidth. Because of the bandwidth limited the packet can’t transmit a long distance. In this network each nodes behaves like a router and they can’t communicate with each other directly. Multiple routing paths are available for a single source to destinations.
computer accesses the same file by using the same network. In ad hoc network we don’t have required poles to transmit the data between devices. If we required transmitting the data between two computers than first we have to create the ad hoc network on first computer and then share the required files. The other computer accesses the same file by using the same network. The speed of transmission is 54mbps which is higher than the normal speed of data transmission.

II. RELATED WORK

TARIK, TALEB, Mitsuru Ochi (2006) proposed a Velocity-Heading Based Routing Protocol (VHRP) [24]. This approach is implemented on the existing routing protocol (DSDV). The simulation result is better in terms of reducing the number of link breakage events and increasing the throughput. After that Victor Cabrera, Francisco J.Ros describes the problem of all the existing VANET routing protocols [4]. Basically the exiting routing protocol of MANETs cannot direly apply on the VANETs. The protocol which are feasible for MANET also feasible for VANETs but there performance depend on the traffic conditions and density. From the analysis there were few number of protocol that will apply on both VANETs and MANETs and gives the better results. The result is the comparison of all the VANET routing protocols. M.Zhang and R.S.Wolf proposed Border node based routing (BBR) protocol [26]. It captures the geographic based traffic information based mobility model (GTI). The results shows the BBR performs well and not relying on a location based services. The result is implemented using the NS2 (network simulator version 2). Jasiane Nzouonta (2009) proposed a routing protocol that is Road-Based Vehicular Traffic (RBVT) [8]. It used the geographical forwarding to transfer the packets between the intersections of the nodes. He designed the proactive protocol RBVT-P and Reactive protocol RBVT-R and compares the result with respective protocols of ad-hoc network and VANETs. We optimize the forwarding message using the distributed election of the next hop. It will increase the average delivery rate with 40% rate, compared with existing protocol. This protocol takes the real time traffic information to create road-based path. The result is compared with the RBVT-P. It performs well in the terms of average delay. Antonios Skordylis (2010) investigate the problem of minimize the utilization of bandwidth in the traffic monitoring system [25]. The efficiency of vehicle traffic system depends on the data’s freshness. If the data is highly fresh than we can easily select the fastest route from source node to destination node. It designed a framework by combining the data delivery and monitoring traffic. The results is better in the terms of reduce the bandwidth utilization and improve the system performance. GJ Archanna, R.Venittaraj (2014) using carry and forward message from source vehicle to nearby Road Side Unit (RSU) and advanced encryption for adding the digital signature to each and every node [30]. To improve the route packets improve the infrastructure of RSU, with this step the route packets is efficiently transmitted. We consider the system in which the vehicles consider the carry and forward technique to transfer the data from source vehicles to destination. It considers the secure mechanism for registered users to the system of RSU. The result compare with existing solutions. It provides feasibility and efficiency to the system. R.S Raw, Vikas Toor (2012) improves the throughput and performance of the VANETS and provides the route becomes stable and reliable [13]. They consider the path duration and link duration because the nodes are moving in a very high speed. The path duration is also considered for predict the behavior of the nodes. To improve the performance of routing protocol calculation of path duration is a key factor (Performance is changed by the changing of connectivity graph). It provides the reliable and efficient route between the nodes. They include the parameters as node density, transmission range and number of hops. Gurpeet Singh, Neeraj Kumar (2014) proposed the innovative ACO based routing technique (ANTALG) it by considering the random source and random destinations [23]. Ants are behaves like the agents .When the ants are moving from one location to another location than pheromone table and data structure has stored. The simulation has performed by considering the different parameters of the nodes. The result is better than the AODV, ADSR, and HOPNET. It has to consider the three phases first one is route setup phase second one is route discovery phase and the third one is route maintenance phase. The result is compared with ADSR and HOPNET and gives the better result as throughput, End-to-end delay, Jitter, and window size. Rajni Singla, Namisha Sharma (2014) provides the security on data so that data reaches the destination easily [29]. It removes the traffic congestion on the road (if the number of vehicles is higher in a region than its cause of congestion). They used the PGP (pretty good privacy) and AOMDV protocol to provide the dynamic path between VANETS. The vehicles location changes from time to time rapidly. So selecting the path from one vehicle to other vehicle is changed from time. S.L.O.B Correia (2011) proposed an ant colony optimization based routing algorithm it takes the information available in vehicular networks such as speed of the vehicles and position of the vehicles [27]. VANETs in which the node speed is very high that is up-to 200 km/h, and that is the impact directly on the ability of the traffic to deliver the data, we might be create the network for a small amount of time. The authors used the dynamic MANET on demand

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III. PROPOSED APPROACH

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This flow chart begins with dividing the universe into regions of predefined range. Then source node is initialized and number of nodes belongs to region 1 is calculated. After that a Hello message is broadcast to each node in the region 1, also neighboring list and topology table is calculated by each node which receives beacon message. Then employed bees will Memorize its food source (node) position and go back to hive (source node). Here the onlooker bees are waiting on the dance area. After getting all the information shared by employed bees, source quality is evaluated. Source quality will be calculated on the basis of distance and density. Value of food source is based on proximity to the nest and richness of energy. Firstly distance of each node from source node is calculated and then density of nodes having maximum

TABLE 2.1 Comparison of related paper of MANETs and VANETs

<table>
<thead>
<tr>
<th>S.No</th>
<th>Approach/ Protocol</th>
<th>Author name (year)</th>
<th>Ideology</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Location</td>
<td>Camara and Louirio</td>
<td>GPSAL</td>
<td>Decreased overhead</td>
</tr>
<tr>
<td>5.</td>
<td>Hybrid</td>
<td>Marwaha et.al</td>
<td>Ant-AODV</td>
<td>Reduced end to end delay</td>
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<tr>
<td>6.</td>
<td>Hybrid</td>
<td>Galshali etal</td>
<td>NNNA</td>
<td>Higher packet delivery ratio and end to end delay.</td>
</tr>
<tr>
<td>7.</td>
<td>Location</td>
<td>Ko and vaidya</td>
<td>LAR</td>
<td>Reduced overhead</td>
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<tr>
<td>8.</td>
<td>Hybrid</td>
<td>Marwaha et al</td>
<td>Ant-Aodv</td>
<td>Reduce end to end delay and route discovery latency.</td>
</tr>
<tr>
<td>9.</td>
<td>Reactive</td>
<td>Osagie et. Al</td>
<td>PACONET</td>
<td>Reduced end to end delay</td>
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<td>10.</td>
<td>Reactive</td>
<td>Elmoniem et. Al</td>
<td>LMBRAA</td>
<td>Reduced average end to end delay</td>
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<tr>
<td>11.</td>
<td>Hybrid</td>
<td>Singh et.Al</td>
<td>ANTALO</td>
<td>Higher throughput and average jitter</td>
</tr>
<tr>
<td>12.</td>
<td>Reactive</td>
<td>Baras and Mehta</td>
<td>PERA</td>
<td>Reduced end to end delay</td>
</tr>
<tr>
<td>13.</td>
<td>Hybrid</td>
<td>Wang et. Al</td>
<td>HOPNET</td>
<td>Reduced end to end delay</td>
</tr>
<tr>
<td>14.</td>
<td>Hybrid</td>
<td>Shiva kumar</td>
<td>MARA</td>
<td>Higher delivery ratio, Lower delay</td>
</tr>
<tr>
<td>15.</td>
<td>Hybrid</td>
<td>Yuan and Xiang</td>
<td>ARAAI</td>
<td>Higher delivery ratio, Lower average delay and flooding redundancy.</td>
</tr>
</tbody>
</table>
distances is evaluated. And the node having highest distance and largest density will be selected as next forwarder. Once a node is visited, that is, if food source is exhausted, that node will be abandoned and will not be further considered. This is done to remove redundancy, that is, one node will not get message more than once.

So that we can sends the message to the destination place with the help of broadcasting technique.

IV. CONCLUSION

VANETs are the collection of vehicular nodes operatory in ad hoc mode. The main issue with VANETs is the high mobility and consistent changes in the direction of vehicle. This made route acquisition and communication a tedious task. The existing routing protocols do not efficiently handle these issues. Then, an improved routing approach is suggested in this paper. The proposed system focuses on the issues such as inaccuracy in choosing the next forwarder node having same distances and redundancy. By reducing the effectiveness of these issues, We make VANETs as the good transportation system. We are going to propose artificial bee colony based on fisheye state routing.

REFERENCES