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Universal Query for Travel Information in Intelligent Transportation System

Ramandeep Kaur, Vikramjit Singh2
1 Assistant Professor, RBIENT, Hoshiarpur, Punjab,
2 Assistant Professor, DAV University, Jalandhar,Punjab

***Abstract*: - Intelligent Transportation System (ITS) applies on advanced technologies of electronics, communications, computers, control and sensing and detecting in all kinds of transportation system in order to improve safety, efficiency and service, and traffic situation through transmitting real-time information.Query to travel information is key to intelligent transportation system in Vehicular Ad Hoc Network (VANET).This paper proposes a universal query for travel information in intelligent transportation system. Universal query gives useful information to drivers and passengers to travel on best available path .**

Keywords- vehicular ad hoc network, connection availability, intelligent transportation system, performance evaluation, dynamic route planning.

I. INTRODUCTION

VANET is a form of Mobile ad-hoc network, to provide communications among nearby vehicles and between vehicles. It is a technology that uses moving cars as nodes in a network (mobile network) so each vehicle can receive and transmit others messages through the wireless network.[12]

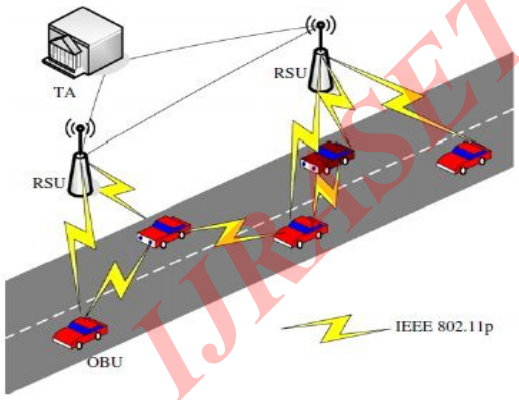

Figure 1. VANET MODEL

The term Intelligent Transportation Systems (ITS) refers to information and communication technology that improves transport outcomes such as transport safety, transport productivity, travel reliability, informed travel choices, social equity, environmental performance and network operation.ITS exploit in-vehicle information technology (e.g. mobile computing and wireless communication) in surface transportation systems are an example of emerging technologies to reduce the impact of traffic congestions. Vehicle-to-vehicle communication systems are an important component of ITS and useful for a wide variety of applications that include incident detection, crash reporting, congestion warning and traveller information dissemination [13].

The Interest in ITS comes from the problems caused by traffic congestion and a interaction of new information technology for simulation, real-time control, and communications networks. Traffic congestion has been increasing worldwide as a result of increased motorization, urbanization, population growth, and changes in population density Congestion reduces efficiency of transportation infrastructure and increases travel time, air pollution, and fuel consumption. Universal query for travel information in intelligent transportation system provide us useful and timely travel information to traveller or passengers to eliminate unnecessary travel and optimise the traffics of transportation system. Through universal query we have to find shortest distance between two cities or source to destination so that the problems of delay due to congestion can be solved.

II. RELATED WORK

AnujPuri et al.(2002) have suggested wireless Token Ring Protocol (WTRP) is a medium access control protocol for wireless networks in Intelligent Transportation Systems.WTRP is efficient in the sense that it reduces the number of retransmissions due to collisions.

K Sampigethaya et al {2005} has suggestegtheit is possible to locate and track a vehicle based on its transmissions, during communication with other vehicles or the road-side infrastructure. This type of tracking leads to threats on the location privacy of the vehicle's.

Karnadi, FelizKristianto et al (2007) has suggested Rapid generation of realistic mobility models for VANETin which vehicles constitute the mobile nodes in the network. Due to the prohibitive cost of deploying and implementing such a system in real world,

Jing Zhao et al. (2008) have suggested the multi-hop data delivery through vehicular ad hoc networks is complicated. The idea adopted is carry and forward,

RajiveBagrodia et al.(2009) have suggested the accurate and efficient evaluation of vehicular network applications such as Intelligent Transportation System (ITS) is based on simulation which integrates transportation simulation and wireless network simulation.Simulation provides dynamic interaction between two simulation domains, which control the vehicles at runtime.

Massimiliano et al.(2009) have suggested traffic monitoring system implemented through Wireless Sensor Network (WSN) technology. Which provide a flexible, robust, low-cost and low-maintenance wireless solution for obtaining traffic-related data that can be used for automatically generating safety warning.

IzzatAlsmadi et al.(2010) has suggested the security issues and how security can be improve in mobile banking services by using RFID.RFID enabled phone for mobile banking security, which solve problems of identity or credit card thefts or security.

Yuh-Shyan et al.(2010) has suggested the unicast protocol, multicast protocol, geocast protocol, mobicast protocol, and broadcast protocol which observed that carry-and-forward is the new and key consideration for designing all routing protocols in VANETs.

Zongwei et al. (2011) have suggested Ubiquitous Query for Travel Information (UQTI) in Intelligent Transportation System over Mobile Relay Network (MRN) to facilitate the needed information access for drivers on the road.Design can achieve much higher packet delivery ratio in network with poor connectivity with tolerant delay.

Sona et al.(2012) has suggested identifying major issues and challenges associated with different protocols and selecting the optimal protocol for future work. One of the main challenges in Vehicular ad-hoc network is of searching and maintaining an effective route for transporting data information.

Ashutosh et al.(2012) has suggested Dijkstra's single source shortest path algorithm is used to find out the shortest path between two places on Google map. Dijkastra's algorithm is very fastest and easy to implement where there are no negative weights. GPS gives the current location of device and it is a great tool for mobile devices for business and others.

Ambarkar et al. (2012) has described the Intelligent Transportation Systems (ITS) are aimed at addressing critical issues like passenger safety and traffic congestion, by integrating information and communication technologies into transportation infrastructure and vehicles.

IV. INTELLIGENT TRANSPORTATION SYSTEM

ITS are advanced applications which provide innovative services relating to different modes of transport and traffic management and enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks. The demonstrating figure 2 will show the working scenario of ITS. This will be adapted from Vi Tran Ngoc Nha et al. (2012).

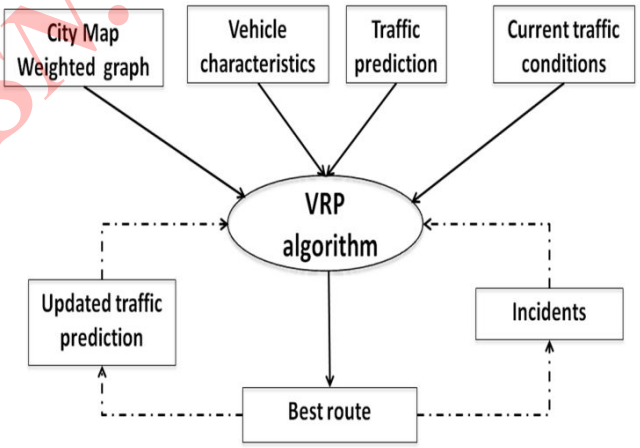

Figure 2Vehicles' routing algorithms: main inputs and updates

A. Query for travel information:The main goal of query for travel information in intelligent transportation system is to find the shortest distance from source to destination by comparative study of algorithms. This will give us the best available path or route to reach at destination so that the problems of delay can be reduced.

In universal query for travel information we have to check following parameters:-

I. Travel distance: - This is the basic criterion for shortest path finding. Each road on the map has its associated length value. Finding the shortest path means searching the route from the origin location to the destination through which the vehicle travels the shortest distance.

II. Travel time: -The travel time is another criterion for route planning algorithm. In this case, we consider the fastest route rather than the shortest one. The fastest route is the path through which the vehicle can reach its destination with within minimum travel time. The fastest path might be different from the shortest path due to the traffic constraints like traffic congestion and random incidents as well as the driving regulations like speed limit.

III. Easiness of driving: - Car navigation device (RSU) should provide user information about safer and more comfortable driving route. This is also considered as driver preference reflected by factors such as number of turns or number of signal or width of the road. Based on this metric, route planning algorithm aims to find a vehicle route satisfying driver's preference the most.

IV. Travel cost: -The travel cost refers to the number of toll tags in the chosen route as well as the estimated fuel consumption level during the journey. This value is not updating. Combination of two or several metrics.

V. Combination of two or several metrics: - In this case, several metrics could be combined together to reflect the drivers preferences.

In general, the following three key evaluation metrics are used to measure the performance of vehicles routing algorithms;

1. Computation complexity
2. Scalability and
3. Quality of the best route.
4. Delay

V. PROPOSED WORK

The basic model of query for travel information in intelligent transportation system is taken from (ZongweiLuoTianle Zhang, Chunlu Wang. RFID enabled vehicular wireless query for travel information in intelligent transportation system.In this paper research has been done on Ubiquitous Query for Travel Information (UQTI) in Intelligent Transportation System over Mobile Relay Network (MRN) to facilitate the needed information access for drivers on the road. The evaluation is based on the computing model and network simulation.The main goal of universal query for travel information in intelligent transportation system is to find best available path from source to destination by comparative study of algorithms. Three main steps are taken to find out best route which are explained as follows in flowchart.

Step 1: calculate an initial best route from the origin location of the vehicle to its desired destination according to a chosen algorithm (e.g. Dijkstra, Algorithm etc.)

Step 2: Re-calculate the best route due to an update in traffic conditions. In this case, whenever a vehicle reached an intersection, the traffic conditions are checked for any update. If there is an update impacting at least on link in the best route, the affected links are removed from the map and the route planning algorithm is re-applied to calculate a new best route for the vehicle. Otherwise, the vehicle carries on its journey.

Step 3: Is the destination location reached? If no, the step 2 is repeated until the vehicle reaches its last intersection and arrives at its desired destination.

The flowchart in figure 3 will show the model of best route updating.

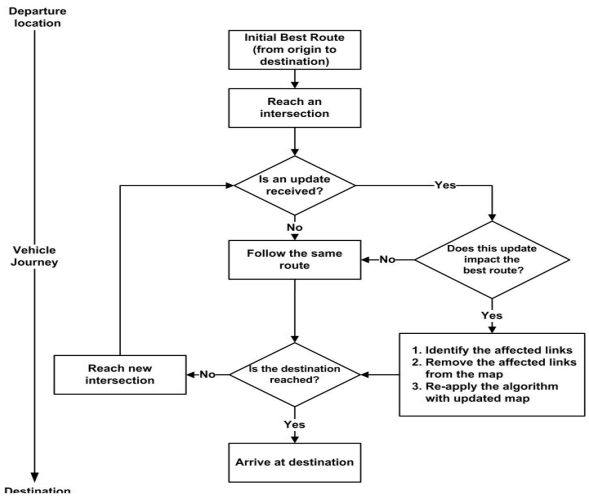

Figure 3- Model of Best Route Updating

VI. CONCLUSION

In this paper the basic idea of universal query for travel information in ITS is presented .the main objective is to reduce the problems of delay due to congestion which can be solved by finding best availability pathfrom source to destination. Suitable simulation is done in MATLAB by considering the problem of delay during computing the best available path. A comparison will be drawn among available shortest path algorithms for VANET.

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REFERENCES

[1] *Duke Lee, Roberto Attias, AnujPuri, Raja Sengupta, StavrosTripakis, PravinVaraiya, A Wireless Token Ring Protocol For Ad-Hoc Networks, 2002 IEEE Aerospace Conference Proceedings, Big Sky, Montana, USA*

[2] Jawalkar D.M., et al. (2012) Improving Road Accidence Monitoring Using Road Traffic Simulation In Vanet. World Research Journal of Engineering and Technology, ISSN: 2278-8530 & E-ISSN: 2278-8549, Volume 1, Issue 1, pp.-01-03.

[3] Zhao, Jing, and Guohong Cao. "VADD: Vehicle-Assisted Data Delivery in Vehicular< emphasis emphasistype=." Vehicular Technology, IEEE Transactions on 57.3 (2008): 1910-1922.

[4] Ashutosh B. Makone. Application for marketing executives implementing dijkstra's shortest path algorithm in android device.pages 1-4, 2012.

[5] Zhang, Mingliu, and Richard S. Wolff. "A border node based routing protocol for partially connected vehicular ad hoc networks." *Journal of Communications* 5.2 (2010): 130-143.

[6] Franceschinis, Mirko, Luca Gioanola, MassimilianoMessere, R. Tomasi, M. A. Spirito, and P. Civera. "Wireless sensor networks for intelligent transportation systems." In Vehicular Technology Conference, 2009.VTC Spring 2009. IEEE 69th, pp. 1-5. IEEE, 2009.

[7] Khatri, Monika, and SonaMalhotra. "BEHAVIOURAL STUDY OF VANET PROTOCOLS."

[8] Luo, Zongwei, Tianle Zhang, and Chunlu Wang. "RFID enabled vehicular wireless query for Travel Information in Intelligent Transportation System." RFID-Technologies and Applications (RFID-TA), 2011 IEEE International Conference on.IEEE, 2011.

[9] Yang, Yi, and RajiveBagrodia. "Evaluation of VANET-based advanced intelligent transportation systems." Proceedings of the sixth ACM international workshop on VehiculArInterNETworking. ACM, 2009..

[10] Lin, Yun Wei, Yuh-Shyan Chen, and Sing-Ling Lee. "Routing protocols in vehicular ad hoc networks: A survey and future perspectives." Journal of Information Science and Engineering 26.3 (2010): 913-932.

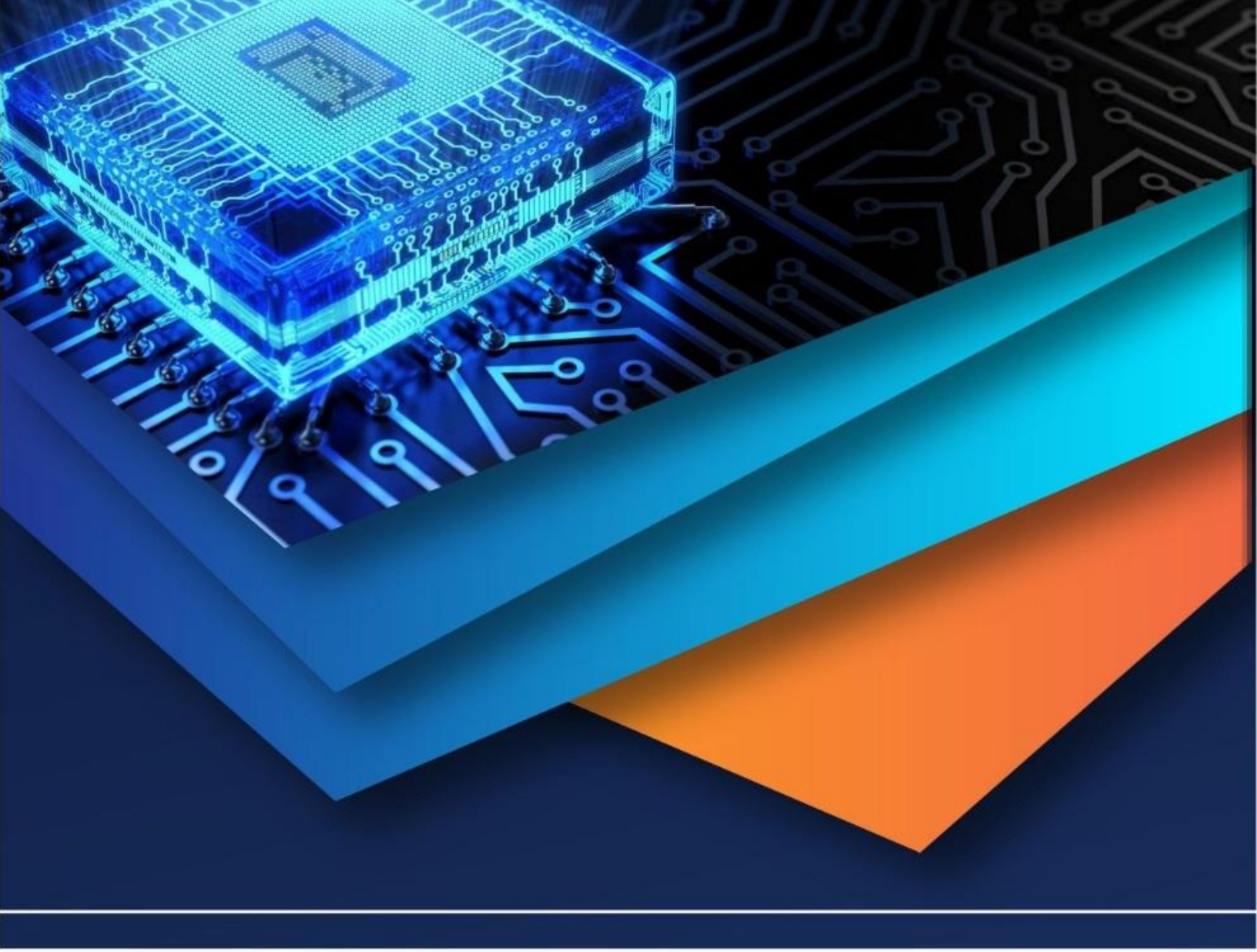
[11] Saleh, Zakaria, and IzzatAlsmadi. "Using RFID to enhance mobile banking security." International Journal of Computer Science and Information Security (IJCSIS) 8.9 (2010): 176-182.

[12] MEGHDADI, Vahid. "Vehicular Ad-Hoc Networks (VANET) applied to Intelligent Transportation Systems (ITS)."

[13] Rizzoli, Andrea E., NicolettaFornara, and Luca Maria Gambardella. "A simulation tool for combined rail/road transport in intermodal terminals." Mathematics and Computers in Simulation 59.1 (2002): 57-71.

[14] Karnadi, FelizKristianto, ZhiHai Mo, and Kun-chanLan. "Rapid generation of realistic mobility models for VANET." Wireless Communications and Networking Conference, 2007.WCNC 2007.IEEE.IEEE, 2007.

[15]k.Sampigethaya, Krishna, et al. CARAVAN: Providing location privacy for VANET. WASHINGTON UNIV SEATTLE DEPT OF ELECTRICAL ENGINEERING, 2005.



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