



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

Distance Based Accident Prevention in Intersection Using Vanet

R.Rajesh kumar¹, S.Wahida Begum², M.Manikandan³

P.G. Student, Department of Computer Engineering, Valliammai Engineering College, Chennai, India¹

P.G. Student, Department of Computer Engineering, Adhiparasakthi Engineering College, Chennai, India²

P.G. Student, Department of Computer Engineering, Adhiparasakthi Engineering College, Chennai, India³

ABSTRACT: As the day moves vehicle population increases daily, The VANET [Vehicular Ad-hoc network] has come up with lot of ideas, Mostly VANET is been used for communication between Vehicles. Not only for communication purpose, VANET also structured for traffic controlling, Navigation, and other application in VANET. In this paper we prevent accident in intersection, by means of the RSU, vehicle 2 vehicle (V2V) communication and VANET. In urban area there will be many intersection of roads without traffic signal, which will help avoiding accident and control traffic. When vehicles move in such area the communication between vehicles is necessary. When communication has been established between vehicles then the vehicle user can able to know about the arrival of other vehicle at the same time to intersection, so the pilot will be alert of the vehicles arrival.

KEYWORDS: VANET, Accident Prevention, RSU, Intersection, OBU.

I. INTRODUCTION

The number of deaths and injuries from traffic accidents has been rapidly increasing. Most of those accidents occur at intersections, because the pilot can't see what's come in the other road which is colliding in his moving road. He can only be alerted through a signal by the other vehicle coming through the other road. In an intersection there are 32 ways to get collision which has been given below in fig: 1.1, a vehicle which meets the intersection can move to any direction of the lanes at the same time other vehicles in other lanes can also move in any direction, so that accident could occur. This accident is been controlled by using the placing signals in the intersection. But in urban area there vehicles will be in less in numbers so that there will be no need for vehicle for all the time. Due to this reason the urban areas will have no signals

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

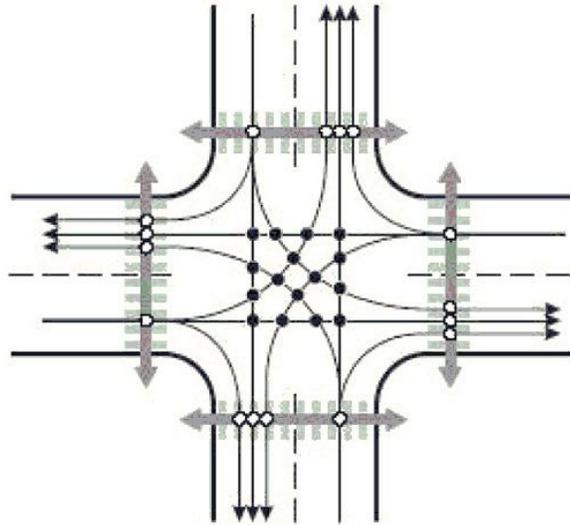


Fig: 1.1 Occurrence of accidents in Intersections

in the intersections, but accidents may occur at any time, so that by using the VANET technology, RSU, OBU we introduce a proposed scheme to prevent the accident in rural and urban areas. When vehicles meet intersection then they need to be guided by signal or some source of unit to have a safety riding and prevent them from accidents. In this paper the source is the VANET communication, by using the communication between vehicles, the alert id given to the other vehicles about the arrival so that the pilot of other vehicle will get alert. This scheme not only works in the intersection, also in any road crossing in any format such as ring road, three road colliding at a single place.

II. RELATED WORKS

VANET is being an emerging technology for safe driving, in paper [1] by using image processing technique the author has given Intelligent Traffic Management System [ITS], so that the vehicles waiting time in the intersection can be reduced. The image processing technique is based on the Canny's Edge detection [1] method which is been considered as the best edge detection technique in the image processing. By using the method the video frames are been taken and processed to find the number of objects in the frame, like the same way number of vehicle in each lanes will be found and lane with high number of objects will be allocated with more time through signal.

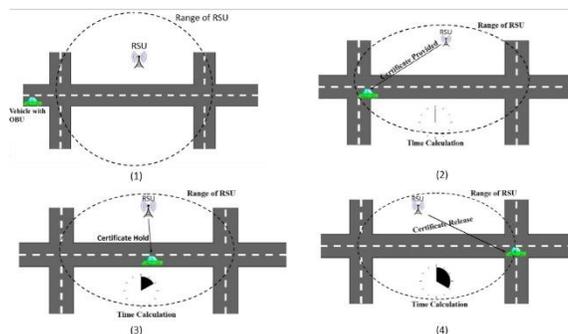


Fig 2.1: STFE Navigation

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

The author of paper [2] estimated the accident detection through telephoto images, this is done through taking images in intersection for a particular period of time and calculating the vehicle positions, and providing information to the vehicle about the other vehicle approach so the vehicle will be alerted. In paper [3] Traffic monitoring and Accident detection at intersection are been calculated by using the VANET technology using parameters the approach of vehicles direction will be identified and vehicles path will be found and monitored by using the information the data will be calculated about the accident and will be sent to the particular vehicles about the accident possibility. In [4] an intelligent concept has been brought out by the author, using the speed of vehicles rolling in the roadways the time will be calculated about the traffic density in a particular area. Here average vehicle speed will be calculated and information will be sent to the server for further process.

The above given fig 2.1 is the STFE Navigation system proposed in [4], here the vehicle which enters a range of an RSU will be provided with an certificate. The time calculation will begin and then the till the vehicles releases the certificate the certificate will be hold by the vehicle. When the certificate has been released the time ticking stops and time for a particular vehicle to cross a particular area/km will be calculated and average speed of vehicle in a roadway will be calculated. In [7] the occurrence of accident has been predicted by using the camera sensing in the intersection and alerting about the vehicle approach to the other vehicles, so that accident can be prevented.

III. ORGANIZATION OF PAPER

We have passed away from abstract which give the overview and also say about the main concept of the paper. In section I, served with a brief and clear introduction about the Accident occurrence and ways of accident occurrence. In session II, Literature survey gone through has been given as related work. In session IV, system which is in present, is given as Accident Occurrence in Intersection, says about the collision caused in the intersection. Session V is allocated with the problem definition, named as Accident Prevention which is about the problem faced in existing system, and solution for those problems. In session VI the conclusion and future work has been discussed, and finally finished with the reference.

Due to accidents people may lose their life or may get injured, so to avoid accidents and safe the life of people many arrangement has been done in VANET technology. Mostly accidents occurs in the intersection so that signals are been kept to make a safe riding. The signals will not be working for all time at night mostly signals will be made yellow indicating the pilot to slow their speed. Even though accidents occurs due to the unknown vehicle appearance at the time of crossing road.

IV. ACCIDENT OCCURRANCE IN INTERSECTION

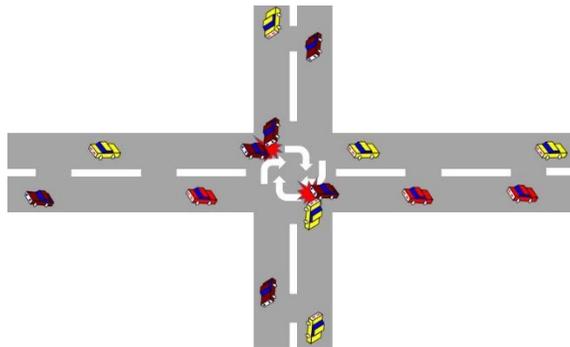


Fig: 4.1 Accident Occurrence in Intersection

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

Here below is shown fig: 4.1 Accident occurrence in intersection denotes the accident occurrence scenario which shows the damage to human life and properties. In this paper preventing these type of accidents are been provided by using the VANET technology by making the distance calculation between vehicles to intersection.

V. ACCIDENT PREVENTION

The main reason for accident in the intersection is not knowing about the vehicle which is upcoming from the other roadway which is colliding and makes the intersection. When we make the vehicles to know about the vehicle which is upcoming we can be able to reduce and prevent accident in the intersection. In accident prevention scheme, VANET communication is been used. Each and every vehicle will be consisting of OBU[On Board Unit], by using RSU[Road Side unit] making the vehicles to get connected with infrastructure. When the vehicle got connected with the infrastructure then a certificate will be provided for the vehicle authorization, after the verification process the vehicle will be connected with the infrastructure and can be able to send and receive information from other vehicles and also from the infrastructure. When a vehicle has a authentication to be connected with the infrastructure then the vehicle will be added to the network, then the particular vehicle which has the authentication will be able to transfer and get information so that the vehicle will be connected with other vehicle. Using this advantage in the VANET network the accident prevention process will be successfully done.

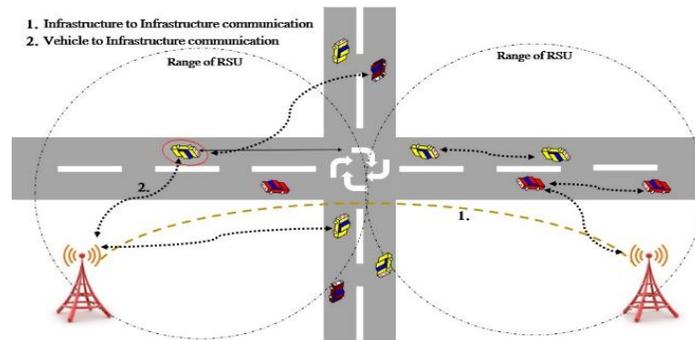


Fig: 5.1 Accident Prevention

In the above fig:51: Accident prevention we can be able to view the range of the RSU[Road Side Unit], the vehicle which are in the range will be connected to the RSU after the authentication process. The vehicle which are approaching the intersection will be calculating the distance for the destination. The vehicle will be knowing about the approaching of the destination by the help of the navigation system which is implemented in [4]. The distance of the particular vehicle to the intersection will be found and will be transmitted to the RSU infrastructure. At the same time the RSU will be able to the information about the vehicles which are approaching the intersection so that, the RSU can be able to calculate which vehicle is near to the intersection. After finding which vehicle is near, the RSU will automatically transmit the message to all vehicle about their position and other vehicle position to vehicles. So that the pilot will be able to know what is about to approach, then the pilot will be aware of vehicle approach as he/she knows about the vehicle position. Now the vehicle will communicate with each other and will possess a safety way to cross the intersection, by sending and receiving information between the vehicles which are about to cross the intersection.

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

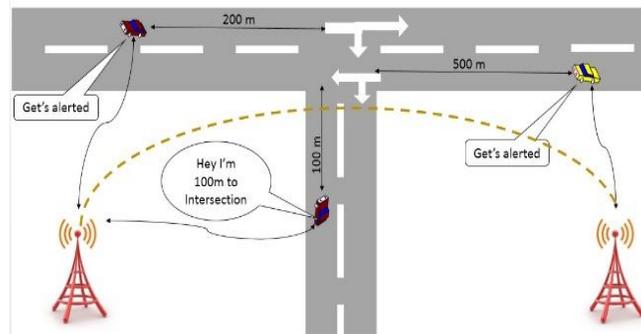


Fig: 5.2working process

In the above fig:5.2 working process, considering some vehicles connected to the infrastructure and those vehicles are to approaching the intersection. Now the process of accident prevention process begins by get the location of each vehicles, and calculate which vehicle is near to the intersection. After the calculation the vehicles position towards the intersection the vehicles will be getting the data or information about the other vehicle's position towards the intersection. Here we have three vehicles approaching to intersection the vehicle with lowest distance towards the intersection will alert other vehicles about its position and distance towards the intersection. So that other vehicle will be alerted about the incoming and get prevented from the collision.

VI. CONCLUSION

Accidents are being major problem in roadways in both urban and rural areas. Accident leads to loss of human life, Injury to human, traffic congestion, and may also leads to other accidents. So there is a necessity to find a way to reduce or prevent these accidents. In the proposed scheme, the accident can be prevented by giving an alert to the pilot who is upcoming to the intersection. This alert can be provided through the VANET communication using RSU, OBU through V2V communication and V2I communication.

REFERENCES

- [1]. Real-Time Image Processing Based Intelligent Traffic Management System G. Kumaresan, C.Vijaykumar, R.Rajesh Kumar, International Journal of Trends in Computer Science, Volume 2, Issue 11, 2013
- [2]. Realtime Danger Estimation at an Intersection by Wide and Telephoto Images, Hideo MORI, Ken'ichi KANEKO, Shinji KOTANI and Kazumi FUJIMA, Proc. IROS 960-7803-3213-X/96/ \$5.00 0 1996 IEEE
- [3]. Traffic Monitoring and Accident Detection at Intersections, ShunsukeKamijoYasuyuki Matsushita Katsushi Ikeuchi Masao Sakauchi, 0-7803-4975-X/98/\$10.00 0 1999 IEEE
- [4]. STFE: Speed Based Approach for Traffic Flow Estimation in VANET, G. Kumaresan R. Rajesh Kumar A. Kanimozhi, International Journal of Engineering Research & Technology (IJERT)Vol. 3 Issue 2, February – 2014. ISSN: 2278-0181
- [5]. A Vision-Based Approach to Collision Prediction at Traffic Intersections Stefan Atev, HemanthArumugam, Osama Masoud, Ravi Janardan, 1524-9050 © 2005 IEEE.
- [6]. PTC-VANET Interactions to Prevent HighwayRail Intersection Crossing AccidentsMark Hartong¹, Rajni Goel², Csilla Farkas³ and Duminda Wijesekera⁴, 1550-2252 ©2007 IEEE
- [7]. Discrimination of an Approaching Vehicle atan Intersection Using a Monocular CameraJunji EGUCHI Hiroyuki KOIKE, Proceedings of the2007 IEEE Intelligent Vehicles SymposiumIstanbul, Turkey, June 13-15, 2007
- [8]. Collision Pattern Modeling and Real-Time Collision Detection atRoad IntersectionsFlora DilysSalim, SengWaiLoke, AndryRakotonirainy, Bala Srinivasan, ShonaliKrishnaswamy, Proceedings of the 2007 IEEE Intelligent Transportation Systems ConferenceSeattle, WA, USA, Sept. 30 - Oct. 3, 2007.
- [9]. Road Intersections as Pervasive ComputingEnvironments: towards a Multiagent Real-TimeCollision Warning SystemFlora DilysSalim, LichengCai, Maria Indrawan. SengWaiLoke, Sixth Annual IEEE International Conference on Pervasive Computing and Communications.



ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 3, March 2014

- [10]. Intersection collision detection and warning protocol: Design Approach Ms.R.S.Mundewadikar, Prof.S.S.Dorle2, Dr.A.G.Keskar3, Ms.M.B.Chakole4.
- [11]. Collision Pattern Modeling and Real-Time Collision Detection at Road Intersections, Flora DilysSalim, SengWaiLoke, AndryRakotonirainy, Bala Srinivasan, ShonaliKrishnaswamy, Proceedings of the 2007 IEEE MoD3.1 Intelligent Transportation Systems Conference Seattle, WA, USA, Sept. 30 - Oct. 3, 2007.
- [12]. A distributed, bandwidth-efficient accident prevention system for interurban VANETs Estrella Garcia-Lozano, Carolina Tripp Barba, Mónica Aguilar Igartua and Celeste Campo,
- [13]. Stubbs, K., Arumugam, H., Masoud, O., McMillen, Veeraraghavan, Janardan, R., Papanikolopoulos, N., "A Real-Time Collision Warning System for Intersections", in Proc. of Intelligent Transportation Systems America, Minneapolis, May 2003.
- [14]. F. D. Salim, S. W. Loke, A. Rakotonirainy, S. Krishnaswamy, "U&I Aware: A Framework Using Data Mining and Collision Detection to Increase Awareness for Intersection Users", in Proc. of The 2007 IEEE International Symposium on Ubisafe Computing (UbiSafe-07), AINA-2007, Niagara Falls, Canada, May 2007.
- [15]. R. Miller and Q. Huang, "An Adaptive Peer-to-Peer Collision detection System", Proc. of Vehicular Technology Conference (VTC) Spring 2002, Birmingham, Alabama.
- [16]. F. D. Salim, S. W. Loke, A. Rakotonirainy, S. Krishnaswamy, "Simulated Intersection Environment and Learning of Collision and Traffic Data Framework", in Proc. of The 4th International Conference on Ubiquitous Intelligence (UIC-07), Hong Kong, July 2007.