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VEHICLE ADHOC NETWORK FOR INTELLIGENT VEHICLE COMMUNICATION SYSTEM

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ABSTRACT

Vehicular Ad-hoc Networks (VANETs), which considers both buses and cars as vehicular nodes running in both clockwise and anti-clockwise directions. It is a hybrid protocol, uses both the greedy forwarding approach and the carry-store-and-forward approach to ensure the connectivity of the routes. Our solution to situations, when the network is sparse and when any (source or intermediate) node left its initial position, makes this protocol better in city scenarios. We only consider Vehicle to-Vehicle (V2V) communication in which both the source and destination nodes are moving vehicles. The paradigm of cross-layer design has been introduced as an alternative to pure layered design to develop communication protocols. Cross-layer design allows information to be exchanged and shared across layer boundaries in order to enable efficient and robust protocols. There has been several research efforts that validated the importance of cross-layer design in vehicular networks.

KEYWORDS: Vehicular Ad-hoc Networks (VANETs),Vehicle to-Vehicle (V2V) communication. Cross layer.

1. INTRODUCTION

Position is a key piece of information in vehicular ad-hoc networks (VANETs), and the use of radar will substantially augment the amount of trust that can be given to the received position information. The goal is to achieve local security by using onboard radar to detect neighbors and to confirm their announced coordinates. Our solution is based on simple principle: "Believe what you see, verify what you hear". By comparing what is "seen", *i.e.*, detected by radar, to what has been reported over the network, a vehicle can corroborate the real position of neighbors and detect malicious vehicles, thus achieving local security. Due to the inherent limitations of radar spatial penetration, we cannot directly use this process to achieve global security, but use local security as a basis for achieving global security. We use preset position-based cells (through which we achieve local security) to create a communication network. Global security is achieved by exchanging packets among cell members and verifying neighboring vehicles' positions. Each vehicle generates information about the state of the sensor based on both what is seen and what is received from other vehicles in the system.

The main aim of this embedded application is to detect the alcohol drunken people. We are developing an embedded kit which will be placed in a vehicle. Now, the vehicle will be under the control of the kit .If any drunken person enter in to the vehicle it gives a buzzer sound immediately , and now the car will be under the control of the hardware used.

The automatic vehicle status detection facility delivers the flexibility, scalability, and responsiveness that today's organizations need. It provides accurate, up-to-minute information, high- speed communication, and powerful analysis features required to make better decisions faster. The major potential comes from the much acclaimed no line of sight and simultaneous reading properties of RFID. The RFID antenna will be coupled to the PC and once the bus is over the Bus indentifying captured from the tag and this is passed on to the PC for processing. RFID technology relies on communication between an applied tag and a reader. Two types of RFID tags are in common usage: passive tags, which have no internal power supply and emit a radio frequency signal only in response to a query from a transponder, and active tags which are internally powered and which continuously emit a radio frequency signal.

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2. LITERATURE SURVEY

SCF-Based Vehicular Routing Over Multiple Communication Gaps. [1].Sok-Ian Sou, and Yinman Lee the technique using store-carry-forward mechanism for vehicular routing in low vehicle density which over come multiple communication gaps. [2].The performance in terms of the Laplace transform of the end-to-end delay via SCF-based vehicular routing. Enhancing VANET Connectivity Through Roadside Units on Highways [1] .Sok-Ian Sou and Ozan K. Tonguz analyze and quantify the improvement in VANET connectivity when a limited number of *roadside units* (RSUs) are deployed and to investigate the routing performance for broadcast-based safety applications in this enhanced VANET environment.[2]. This paper has investigated the impact of RSU deployment on the performance of safety applications for VANETs in highway scenarios. Providing Differentiated Levels of Service Availability in VANET Communications. [3].Jacek Rak , the idea of multipath vehicle-to-vehicle routing to provide protection against link failures. achieving continuity of transmission in the presence of inter-vehicle link failures being result of vehicles mobility. [4].analyze the performance of CBM-AODV algorithm in comparison to the reference AOMDV scheme confirmed benefits of our technique in terms of the average path cost and the average path lifetime.

3. RESEARCH METHODOLOGY

There are frequent failures in the VANET routing paths due to short transmission range. Also, disconnections due to gaps in the network. Because of fading effect in highway and urban environments, large buildings, tunnels, induce severe signal degradation/loss. End to end delivery delay problem. Problems in reliable data transmission during V2V communication. Less energy efficiency due to packet loss. In this project the objective is to solve the disconnectivity problem due to short range communication, using protocol ACAR has more successfully-delivered packets with continuous connectivity between the vehicle. Another objective for 4 lane road, cross communication doing for detecting falsie messages, for the purpose of vehicular safety communication. Another objective, vehicle surrounding information such as, speed of vehicle, obstacles, etc. display on OBU.

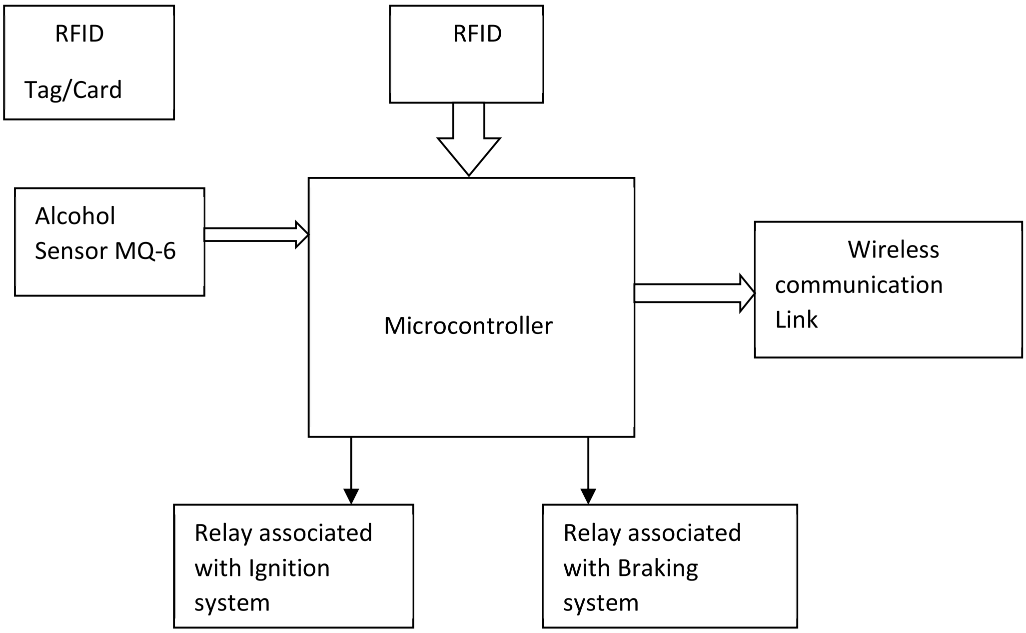

FIG 1. Message flow Diagram

4. PROPOSED SYSTEM

- For communication for V2V connectivity between vehicle to vehicle overcome using ACAR protocol using both the greedy forwarding approach and the store-carry-and-forward approach to minimize the packet drop rate.
- Packet Loss should be less in case of V2V-V2R communication with fixed RSU when compared to the V2V communication.

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- The mechanism of message cross verification for four lane communication with forward and reverse vehicle on road.
- By introducing additional number of RSUs based on the Lane distance and the traffic density the delay time can be significantly reduced and communication can be made more effective.
- The vehicle surrounding information display on OBU for driver safety.
- The expected result of my project is better in term of connectivity between the vehicle, cross message verification, and surrounding information display on OBU. Network performance is better in terms of communication between V2V and V2R.
- The simulation result presented using .net programming c#.

5. CONCLUSION

We introduced the system, which is a part of project Road side that is still under development. The goal of View is to provide the driver of a vehicle with information about traffic and road conditions. The importance of the system is to gather and differnciating traffic information between the vehicles on the road. We presented the basic design of the system, and the algorithms used for data aggregation and information dissemination using the standards. Privacy is an important issue in such a system. Different privacy levels should be available from which the drivers can select. One level of privacy could be to completely hide any information about the vehicle while it continues to participate in relaying other vehicles' information. Another level is to allow others to gain information about the vehicle without identifying it. Security and trust are two other important issues in such a system. A fraudulent vehicle could disseminate information about nonexistent vehicles, or broadcast bogus information about existing vehicles. Different mechanisms should be proposed to prevent this and to identify those fraudulent vehicles to avoid them. For future work, we are continuing to work in a number of different directions as the privacy and the security issues. We are experimenting with a linear programming model to estimate the aggregation parameters dynamically based on the road condition. We believe that the project will greatly enhance and ease the driving experience. At the same time, they will encourage and trigger several applications to be built over these systems.

REFERENCES

[1] J. Rak, "Providing differentiated levels of service availability in VANET communications," IEEE Commun. Lett., vol. 17, no. 7, pp. 1380–1383, Jul. 2013
[2] S.-I. Sou and O. K. Tonguz, "Enhancing VANET connectivity through roadside units on highways," IEEE Trans. Veh. Technol., vol. 60, no. 8, pp. 3586–3602, Oct. 2011.
[3] A. Kesting, M. Treiber, and D. Helbing, "Connectivity statistics of storeand- forward intervehicle communication," IEEE Trans. Intell. Transp. Syst., vol. 11, no. 1, pp. 172–181, Mar. 2010
[4] Y. Lee, M.-H. Tsai, and S.-I. Sou, "Performance of decode-andforward cooperative communications with multiple dual-hop relays over Nakagami-m fading channels," IEEE Trans. Wireless Commun., vol. 8, no. 6, pp. 2853–2859, Jun. 2009.
[5] Y.-A. Daraghmi, C.-W. Yi, and I. Stojmenovic, "Forwarding methods in data dissemination and routing protocols for vehicular ad hoc networks," IEEE Netw., vol. 27, no. 6, pp. 74–79, Nov./Dec. 2013.
[6] V. N.G.J. Soares, J. J.P.C. Rodrigues, and F. Farahmand, "GeoSpray: A geographic routing protocol for vehicular delay-tolerant networks", in Information Fusion, 2011.
[7] Wizzy Digital Courier – leveraging locality. http://www.wizzy.org.za/ (June 2011).
[8] A. Pentland, R. Fletcher, and A. Hasson, "DakNet: rethinking connectivity", in Developing Nations, IEEE Computer, pp. 78-83, 2004.
[9] A. Seth, D. Kroeker, M. Zaharia, S. Guo, and S. Keshav, "Low-cost communication for rural internet kiosks using mechanical backhaul", in 12th ACM International Conference on Mobile Computing and Networking (MobiCom 2006), Los Angeles, CA, USA, Sept. 24-29, 2006.
[10] R. B. Braga and H. Martin, "Understanding Geographic Routing in Vehicular Ad Hoc Networks", in GEO Processing 2011: The Third International Conference on Advanced Geographic Information Systems, Applications, and Services, 2011.
[11] G. Liu, B.-S. Lee, B.-C. Seet, C.-H. Foh, K.-J. Wong, and K.-K. Lee, "A Routing Strategy for Metropolis Vehicular Communications", in International Conference on Information Networking (ICOIN), pp. 134-143, 2004.

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

[12] S. Kohli, B. Kaur, and S. Bindra, "A Comparative study of Routing Protocols in VANET", 2010.
[13] K. C. Lee, U. Lee, and M. Gerla, "Survey of Routing Protocols in Vehicular Ad Hoc Networks", in IGI Global: International Publisher of Science, Technology, Medicine (STM) Books and Journals, 2009.
[14] A. Boukerche, H. A.B.F. Oliveira, E. F. Nakamura, and A. A.F. Loureiro, "Vehicular Ad Hoc Networks: A New Challenge for Localization-based Systems", in Computer Communications, 2008.
[15] J. Bernsen and D. Manivannan, "Unicast routing protocols for vehicular ad hoc networks: A critical comparison and classification", in Pervasive and Mobile Computing, pp. 1-18, 2009.
[16] A. Hunter, "The Road to Ubiquitous Geographic Information Systems Roam Anywhere – Remain Connected", in The 12th Annual Colloquium of the Spatial Information, 2000.
[17] B. Jiang and X. Yao, "Location-based services and GIS in perspective", in Computers, Environment and Urban Systems, pp. 712-725, 2006.