International Journal of Scientific Research & Engineering Trends
Volume 6, Issue 3, May-June-2020, ISSN (Online): 2395-566X

A Survey of Smart Vehicles on Internet of Things

Lecturer Dinesh Bhuriya
Dept. of Computer Science & Engineering
Govt. Women's Polytechnic, Indore

Abstract – **In a Smart City, all articles should be savvy subsequently would have implanted processors and capacity to speak with one another through wired or remote associations .These inexorably shrewd items would give sheltered and advantageous condition through developing interconnection and interoperability, which is likewise named as Internet of Things (IoT), Within the goals of IoT additionally lies the vehicle to keen item correspondences, vehicles assume a significant job for protected and helpful travel. The principle vision of the Internet of Things (IoT) is to furnish reallife physical articles with figuring and correspondence capacities so they can associate with one another for the social great. As one of the significant individuals from IoT, Internet of Vehicles (IoV) has seen fast improvement in correspondence advancements. Presently, vehicles can without much of a stretch trade security, productivity, comfort-related data with different vehicles and frameworks utilizing vehicular ad hoc networks (VANETs). Where vehicles are the key social elements in the machine-to-machine vehicular informal communities. The close to constant applications offer protected and proficient travel of the vehicle clients, and the disconnected information guarantees savvy conduct of the vehicles and information examination for the vehicle specialists. We have recognized the social structures of IoV segments, their connections, and the collaboration types. We have planned VANETs segments into IoT engineering reference model to offer better reconciliation of IoV with other IoT areas. At long last, we give the usage subtleties and the exploratory investigation to show the productivity of the proposed framework just as incorporate diverse application situations for different client gatherings, down to earth arrangement of the proposed framework and utilizing it to gather genuine IoV related multi-modular tangible data in city or urban zones can be another fascinating heading We imagine that the IoV would be a necessary piece of astute vehicle frameworks later on brilliant urban communities.**

Keywords– **VANET, DSRC, IoV.**

I. INTRODUCTION

The internet of things is a network of physical object or things that are embedded with electronics, software and sensors having the ability to collect data from the world around us and share data across the internet. The concept of internet of things was introduced by the members of the radio frequency identification development community in 1999.It is very popular because of growth of mobile devices, embedded and real time communication, cloud computing and data analytics. Here are three C's of IOT i.e. Communication, Control and Automation, Cost Saving. The phrase internet of things refers to the general idea of things, especially everyday object, that are readable, recognizable, locatable, addressable, controllable via the internet, irrespective of the communication means such as wired and wireless LAN, WAN, etc. The things or object of the real world can be People, Location(object), Time of information(object).

wireless communication technologies are applied in different areas of daily life. Vehicles are being equipped with wireless communication devices, enabling them to communicate with other cars, and with centralized systems by using road-side infrastructure nodes. These communications offer new opportunities for developing new applications for vehicles. By using this technology, the automotive industry is able to improve transportation systems efficiently. In vehicular environments, wireless technologies enable peer-to-peer mobile communications among vehicles (V2V), as well as communications between vehicles and infrastructures (V2I). For this reason, vehicular networks are considerably used in ITS. In order to allow V2I communications, vehicular networks are commonly equipped with Road Side Units (RSUs) consisting on static nodes that behave like the rest

International Journal of Scientific Research & Engineering Trends
Volume 6, Issue 3, May-June-2020, ISSN (Online): 2395-566X

of mobile nodes, but they usually have internet connection through cable.

II. RELATED WORK

This section presents the most relevant work to VSNs. As will be evidenced throughout this paper, our work provides analytical and experimental evaluation of the proposed system's performance, whereas most of the works discussed in the literature only suggest VSN designs without supplying performance results. Moreover, compared to other similar systems, our system is more complete in that it describes and analyses the overall system and its interactions.In[8] a novel framework for vehicle social networks with a dynamic trust capability that aims to minimize the impact of malicious behaviours in the social network.In[3]proposed a framework,VeDi, for vehicular crowd sourced video social network over VANETs. In the proposed work, vehicles share metadata-based description of videos that are captured by the occupants of the vehicle and are accessible to surrounding vehicles.

In [4] It defines important components, their interactions, and interrelations, which are inspired from the structure of SIoT. A structure of interaction message is provided which adopts DSRC standards that can support various applications such as safety,efficiency, and infotainment.The novel concept of SocialInternet of Things (SIoT), based on a sort of social relationship among objects, analogously to what happens for human beings[5].Using RoadSpeak framework different people traveling along the same roadways at the same time can form virtual mobile communities. They present the design of Road Speak, an inter vehicle voice chat system that allows users to automatically join Voice Chat Groups along these roadways [11].

III. PROPOSED SYSTEM

Nowadays DSRC based on the Wi-Fi standard is widely used in VANETs for connecting the infrastructure to vehicles and vehicles to- vehicles with a two-way short-range radio which is cheaper compared to other wireless standards that are available. The DSRC/WAVE systems fill a niche in wireless infrastructure by facilitating low latency, geographically local, high data rate, and high mobility communications. In VANETs there are two types of links: vehicular-to-vehicular communication (V2V), based on an Ad hoc architecture, vehicles share messages without a central coordinator; and vehicle-to infrastructure or infrastructureto-vehicle (V2I or I2V), where the messages are exchanged between the vehicles and the RSUs.

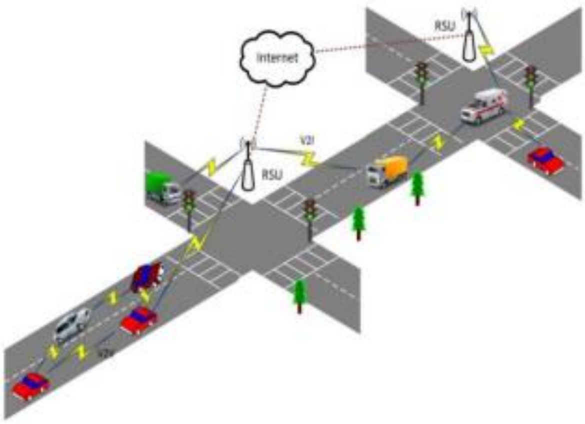

Fig.1.Vehicular Ad hoc Network Scenario.

VANETs are designed for a huge range of cooperative applications, which are services that provide information to the drivers thanks to the data shared between vehicles over the net. These can be safety and non safety applications, which allow several added services as infotainment, traffic management, Auto toll collection, Emergency Run and geographical based services and so on.

The proposed introduces a Intelligent Vehicular network, where each vehicle is a sender, a receiver and a router at the same time, which is the main reason that it can broadcast the information to the VANET, which uses this information to provide these instruction to the drivers. The OBU is the hardware in charge of processing these data and it also avails these short range wireless ad hoc networks (Range is around 200 meters) but it also must dispose other systems that allow reporting position information such as Global Positioning System (GPS) receiver for more accurate position information if required. This information is quite important because most of the services that are available in a VANET totally depend on the geographical position of the source and the destination.

IV.COMMUNICATION IN VANET

Nowadays, vehicles incorporate a series of sensors to get information about different areas. Examples of them are crash sensors occupant position sensors, rain sensors, or seat belt tension sensors. Therefore, it is possible to obtain key information from these sensors when an accident occurs. Furthermore, we consider that future vehicles will get additional information from the environment and its occupants, since vehicles will be provided with sensors capable of knowing if there are pedestrians or cyclists involved in an accident, and also information regarding the health of the occupants such as blood group or heart problems will be available. Currently, there are some approaches addressing these issues; for example, the Ford Motor Company is designing seats that can monitor the driver's heartbeat in real time. For personal information and health data of the occupants, we consider that occupants could have this information previously stored in their smart phones. Hence, our system would automatically collect this data when passengers enter into the vehicle by using wireless technologies such as Near Field Communication (NFC) or Bluetooth.

To allow estimating the severity of the accidents, we use the General Estimates System (GES), an historical database maintained by the National Highway Traffic Safety Administration, which contains information related to previous traffic accidents, obtained from a sample of Police Accident Reports (PARs) collected all over the USA roads. To protect individual privacy, no personal information such as names, addresses or specific crash location is coded. We used data from thousands of real accident situations to develop an accident detection algorithm which was able to correctly predict the event of an accident in all the experiments. The thresholds used to differentiate between accident and non-accident situations were selected in order to minimize the error in the prediction.

Vehicle dataset:

Field	Description
Chassis	Vehicle chassis number
Make	Manufacturer of the Vehicle
Model	Vehicle Model
Model Year	Vehicle Model Year
Body Type	Vehicle Body Type
Trailer	If vehicle is towing trailer units
Num occupants	Number of vehicle occupants
Haz Mat	If vehicle is carrying hazardous material
Haz Mat T	Hazardous Material Type
Emcy	If vehicle is on emergency run
Spec use	Vehicle special use category applied
License Plate	Vehicle plate number

V. FEATURES OF VEHICULAR NETWORKS

Vehicular networks are composed of vehicle-to-vehicle communications (V2V) and vehicle-to-infrastructure communications (V2I). For this reason, vehicles and RSUs are necessary to form a vehicular network. Figure 2 shows an example of a vehicular network. As shown, there are communications among vehicles, and between vehicles and the infrastructure. In addition, using the infrastructure, vehicles are able to access to Internet. V2V communications have the following advantages: Allow short and medium range communications, Present lower deployment costs, support short messages delivery, and Minimize latency in the communication link.

VI. APPLICATIONS USING VEHICULAR NETWORKS

The specific characteristics of Vehicular networks favour the development of attractive and challenging services and applications.

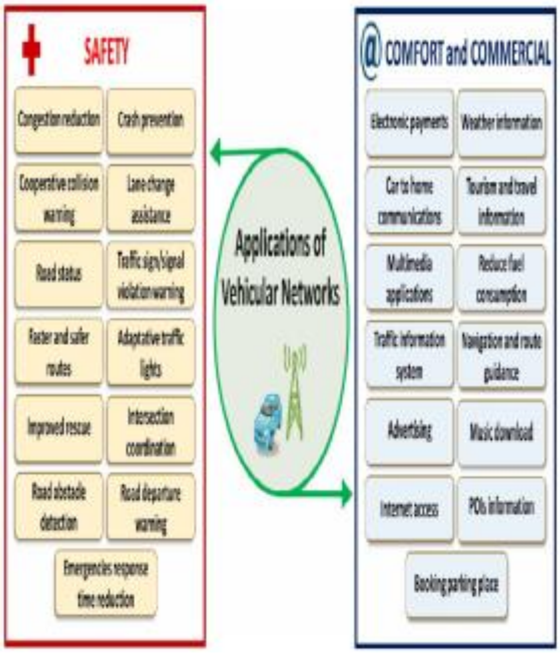

Fig.2. Applications Using Vehicular Networks.

VII. CONCLUSION

Using different approaches, we can reduce the emergency services arrival time when an accident occurs, trying to avoid traffic jams that could result from this particular situation. Moreover, we can conclude that traffic density is a key factor to distribute traffic in an efficient manner. Proposal of a method that allows estimating the vehicular density in urban environments at any given time by using the communication capabilities between vehicles and RSUs. Our vehicular density estimation algorithm takes into account not only the number of signals received by the RSUs, but also the topology of the map where the vehicles are located. In a scenario where vehicles are moving fast and the topology of the network is changing continuously, the big challenge is to keep connected all the nodes and give them all of the resources to transmit and receive information in real time.

REFERENCES

[1]. Serbanati, C. M. Medaglia, and U. B. Ceipidor, ''Building blocks of the Internet of Things: State of the art and beyond,'' in Deploying RFID - Challenges, Solutions, and Open Issues, C. Turcu, Ed. Rijeka, Croatia: InTech, 2011.

[2]. J. Barrachina et al., ``CAOVA: A car accident ontology for VANETs," in Proc. IEEE Wireless Commun. Netw. Conf., Apr. 2012, pp. 1864_1869.

[3]. K. M. Alam, M. Saini, D. T. Ahmed, and A. El Saddik, ``VeDi: A vehicular crowd-sourced video social network for VANETs," in Proc. IEEE 39th Conf. Local Comput. Netw. (LCN), Sep. 2014, pp. 738_745.

[4]. K. M. Alam, M. Saini, and A. El Saddik, ``tNote: A social network of vehicles under Internet of Things," in Internet of Vehicles_Technologies and Services. Berlin, Germany: Springer-Verlag, 2014, pp. 227_236.
[5]. L. Atzori, A. Iera, and G. Morabito, ``SIoT: Giving a social structure to the Internet of Things," IEEE Commun. Lett., vol. 15, no. 11, pp. 1193_1195, Nov. 2011.
[6]. L. Atzori, A. Iera, G. Morabito, and M. Nitti, ``The social Internet of Things (SIoT)_When social networks meet the Internet of Things: Concept, architecture and network characterization," Comput. Netw., vol. 56, no. 16, pp. 3594_3608, Nov. 2012.
[7]. M. Al-Hader, A. Rodzi, A. R. Sharif, and N. Ahmad, ``Smart city components architicture," in Proc. Int. Conf. Comput. Intell., Modelling Simulation, Sep. 2009, pp. 93_97.
[8]. N. Abbani, M. Jomaa, T. Tarhini, H. Artail, and W. El-Hajj, ``Managing social networks in vehicular networks using trust rules," in Proc. IEEE Symp. Wireless Technol. Appl., Sep. 2011, pp. 168_173.
[9]. R. Fei, K. Yang, and X. Cheng, ``A cooperative social and vehicular network and its dynamic bandwidth allocation algorithms," in Proc. IEEE Conf. Comput. Commun. Workshops, Apr. 2011, pp. 63_67.
[10]. S. Haller, ''The things in the Internet of Things,'' in Proc. Internet Things Conf., 2010, pp. 1–3.
[11]. S. Smaldone, L. Han, P. Shankar, and L. Iftode, ''RoadSpeak: Enabling voice chat on roadways using vehicular social networks,'' in Proc. 1st Workshop Social Netw. Syst., 2008, pp. 43–48.
[12]. S. Yousefi, E. Altman, R. El-Azouzi, and M. Fathy, ``Analytical model for connectivity in vehicular ad hoc networks," IEEE Trans. Veh. Technol., vol. 57, no. 6, pp. 3341_3356, Nov. 2008.