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Design Of Hand-Held Alert System Providing Security For Individuals Using Vehicular Ad-Hoc Network

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Abstract: *Vehicular Ad-hoc Network (VANET) and Mobile Ad-hoc Network (MANET) provide a distinguish approach for Intelligent Transport System (ITS). The existing applications in VANET provide secure message passing and circulation of data within the range, but there are very few applications where individual's security is taken into consideration. In new applications we can make one which provides safety for individuals on road or indirectly related to roads or vehicles. For making such an application we will be using Radio Frequency (RF) signals, VANET network, GPS and GSM techniques. RF signals will be generating input signals; vehicles for making an alarm for generated signals; VANET network to spread the information about panic area to the other vehicles in range; GPS & GSM to track the location & position of victim and send this information to authorized helping system respectively. Thus using all above techniques and principles we are designing a scheme which provides safety using VANET protocols.*

Keywords: *RF signals; VANET; GSM; GPS.*

I. Introduction

VANETs are the subgroup of MANETs with the distinguishing property that the nodes are vehicles like cars, trucks, buses and motorcycles. Such systems aim to provide communications between individual vehicles said as V2V (IVC) and between vehicles and nearby fixed equipment, or roadside units said as (V2R/V2I). This implies that node movement is restricted by factors like road course, encompassing traffic and traffic regulations. Because of the restricted node movement it is a feasible assumption that the VANET will be supported by some fixed infrastructure that assists with some services and can provide access to stationary networks. The fixed infrastructure will be deployed at critical locations like slip roads, service stations, dangerous intersections or places well-known for hazardous weather conditions. Thus the goal of VANET, is to improve traffic safety by providing timely information to drivers and concerned authorities. VANET provides Inter Vehicular Communication (IVC), Hybrid Vehicle Communication (HVC) and Roadside Vehicle Communication (RVC). But with respect to project only IVC is beneficial, so that the message of panic area is given to the other vehicles of that area i.e. the broadcasting of panic or alert message to the vehicles present in the vicinity of victim.

We have also witnessed a significant increase in the number of attacks on public, in recent years, but we haven't yet managed to restrict those attacks. Due to such street attacks on people, it has become difficult for people to travel safely on roads. To have a helping hand in restricting the attacks, we are introducing a new concept of "Alarm scheme using VANET protocols for safety applications". This is executed by using the electronic devices and new technologies. To implement this concept, in practice, a person has to carry a small safety unit equipped with RF(Radio Frequency) Communication system and GSM/GPS(Global System for Mobile/Global Positioning System) services.

Radiofrequency signals are the most widely used means of wireless communication, next to Infrared light. Unlike infrared light, RF-signals have advantage in the fact that the signal can travel around obstacles to reach the destination. RF-signals allow reliable communications across wide range of distances. Radio technology is as reliable and almost as inexpensive as Infrared light. The frequency band which is selected for the worldwide is the available 2.4 GHz (known from Bluetooth and Wi-Fi) and the protocol is based on the IEEE 802.15.4 standard.

GSM i.e. Global System for Mobile Communications, originally Groupe Spécial Mobile, is a standard set developed by the ETSI to describe protocols for second generation digital cellular networks used by mobile phones. The GSM standard was developed for replacing the first generation analog cellular networks, and originally described a digital circuit-switched network optimized for full duplex voice telephony.

Using GPS (Global Positioning System) and a GPS tracking unit we can determine the precise location of a vehicle, person, or other asset to which it is attached and to record the position of the asset at regular

intervals. The recorded location data can be stored within the tracking unit, or it may be transmitted to a central location data base, or internet-connected computer, using a cellular GPRS or SMS, radio or satellite modems embedded in the unit. This allows the asset's location to be displayed against a map backdrop either in real time or when analyzing the track later, using GPS tracking software.

The problem statement says: VANET provides us with road safety measures, secure message passing, traffic jam updates, services like e-mail, audio/video sharing and internetworking. But nowhere individual's security is not taken into consideration, we are designing an alarming system for those individuals using VANET protocols.

The objectives to overcome the problems are as follows: 1. To create a technique which helps an individual, who is in non secure state, to communicate to the nearest communicative station, using technologies and VANET protocols & principles for proper help. 2. Uses a gadget which produces a panic alarm through the vehicles, using RF signals.

II. Literature Survey

Vaishak P., T. Sivakumar [1], has described in this paper about the efficient network connectivity because, when data is send from vehicle , it is possible that the track of node or vehicle may change, so for secure transfer of message a reliable network has to be maintained. Interoperability between VANET module and WiMAX are possible for achieving reliable network connectivity and for secure data transfer and also to obtain high end to end ratio. This paper proposes a protocol has been made which constitutes the combination of WiMAX and VANET technologies. So using this combination we can send message either through WiMax or VANET module.

Iman M. Almomani, Nour Y. Alkhalil, Enas M. Ahmad and Rania M. Jodeh [2], has described in this paper about the transferring of data or information or messages via GSM (Global System for Mobile) and GPRS (General Packet Radio Service) between the vehicles and the internet environment. It also comprises about the working architectures of vehicle positioning and vehicle tracking using GPS (Global Positioning System). This system is useful for fleet operators in monitoring driving behavior of employees or parents monitoring their teen drivers. Moreover, this system can be used in theft prevention as a retrieval device in addition of working as a security system combined with car alarms. The main contribution of this paper is providing two types of end user applications, a web application and a mobile application. This way the proposed system provides a ubiquitous vehicle tracking system with maximum accessibility for the user anytime and anywhere.

Zongwei Luo, Tianle Zhang and Chunlu Wgan [3], has explained about the architectures using a mobile relay network or a connected network which is made for a node to node communication, for an Intelligent Transport System, for the purpose of travelling information. RFID enabled Vehicular Ad hoc Network (VANET) emerges as an alternative which can leverage mobile nodes to bridge the gap between information isolated islands often existing in mobile and wireless networks.

Sae Fujii, Atsushi Fujita, Takaaki Umedu Hirozumi Yamaguchi, Teruo Higashino and Shigeru KanedaandMineo Takai [4], has described in this paper about the vehicle to vehicle communication (V2V), which is the primary goal of VANET, using GPS services and other communication techniques. The proposed system operates in a distributed manner and works even if all vehicles nearby do not or cannot participate in the system. Each vehicle acquires various pieces of positioning information with different degrees of accuracies depending on the sources and regency of information

Ghassan Samara, Wafaa A.H. Al-Salihy and R. Sures [5], has described in this paper about the security issues related to VANET. In simple words, the problems and solutions to keep data safe and secure are provided in this paper, for authenticated message passing. The need for a robust VANET networks is strongly dependent on their security and privacy features, which will be discussed in this paper. In this paper a various types of security problems and challenges of VANET been analyzed and discussed; we also discuss a set of solutions presented to solve these challenges and problems.

Vasilis Verroios, Carmen Ruiz Vicente and Alex Delis [6], In this paper, we propose a broadcasting protocol that alerts drivers about the presence of moving vehicles demonstrating hazardous driving behavior. In order to limit the volume of redundant transmissions, our approach selects the vehicles to be responsible for transmitting the emergency information for a hazardous vehicle. In this context, we provide mechanisms to create and maintain a chain of transmitters. This chain “covers” the road sections on which a hazardous vehicle is moving.

Our protocol attempts to increase the probability that an endangered vehicle does obtain timely information about a hazardous vehicle and reduce the total communication traffic imposed in urban environments where the vehicles’ density is often high.

III. Proposed Research And Methodology To Be Employed

A. Proposed Research:

The concept of this project mainly focuses on the safety measures of public on streets. Whenever a person carrying a safety unit with himself is attacked by someone on a street, he has to press the panic button of the Safety Unit. As soon as the panic button is pressed, a noisy alarm will get activated in the nearby vehicles with the help of RF Communication. After that, this alarm will also get activated in other vehicles. Here, VANET Technology is used. Eventually, a message will be sent to the nearby Police station to inform the police about the incident. The proposed architecture is shown in fig a.

Since a noisy alarm is activated in the vehicles, the driver of the vehicle will stop the vehicle and check for the fault. Due to this, automatically, a crowd will be created and attention will be gathered towards the happening incident. Also with the help of GPS system, police can locate the victim and help him in the best way they can. Because of all these actions, the attacker might get caught and the motive of restricting the attacks can be achieved at a certain extent.

B. Proposed Methodology:

In the research methodology we will consider the following steps for complete working of application:

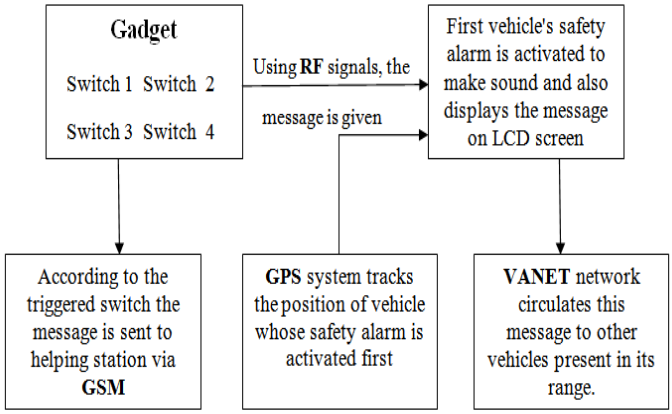

fig a : Proposed Architecture

Step1: Communication between gadget and first vehicle will be done using RF signaling technique; out of four switches, when any of the switch is triggered, the safety alarm of nearest vehicle get's activated, the signal reaches till vehicle using RF signals

Step2: The position of victim will be located using GPS of the nearest vehicle whose safety alarm was generated; the location of alarming vehicle is obtained, so that the area of troubled person is noted.

Step3: Communication between vehicle to vehicle i.e. V2V will be done using VANET technique; this is required to circulate the message of panic situation to the vehicles who are in range and can help.

Step4: Communication between vehicle and authorized help like police will be done via GSM technology; when the switch is triggered by person at that same time the message is given to the authorized helping station using GSM technology.

IV. Expected Outcome

This paper helps in proposing a new methodology for designing an alarming system for individuals on roadside or in vehicles using the RF technology and VANET system for making the alarm work. The sending of messages to the authorized station via the GSM network and also locating the victim's area with the help of the alarming vehicle. In future we will work with the GPS to locate the exact position and location of victim and VANET communication for communicating with the nearby vehicles present in the range of victim's gadget. This paper concentrates on the public safety measures using electronic gadgets. This concept includes new invented technologies such as VANET which proves advantageous to the system. This paper also covers the literature survey of all the technologies involved in the system.

REFERENCES

[1] Vaishak.P, T.Sivakumar, "An Efficient Routing Protocol for Minimizing Multi-hop in VANET using WiMAX " , International Journal of Scientific & Engineering Research, Volume 4, Issue 6, June-2013, ISSN 2229-5518.

[2] Iman M. Almomani, Nour Y. Alkhalil, Enas M. Ahmad and Rania M. Jodeh, "Ubiquitous GPS Vehicle Tracking and Management System", IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT), 2011.

[3] Zongwei Luo, Tianle Zhang and Chunlu Wgan, "RFID Enabled Vehicular Wireless Query for Travel Information in Intelligent Transportation System", IEEE International Conference on RFID-Technologies and Applications, 2011.

[4] Sae Fujii, Atsushi Fujita, Takaaki Umedu Hirozumi Yamaguchi, Teruo Higashino, Shigeru KanedaandMineo Takai, "Cooperative Vehicle Positioning via V2V Communications and Onboard Sensors", IEEE 2011.

[5] Ghassan Samara, Wafaa A.H. Al-Salihy and R. Sures, "Security Analysis of Vehicular Ad Hoc Networks", Second International Conference on Network Applications, Protocols and Services, 2010.

[6] Vasilis Verroios, Carmen Ruiz Vicente and Alex Delis, "Alerting for Vehicles Demonstrating Hazardous Driving Behavior", MobiDE '12, Scottsdale, Arizona, USA, 2012 ACM 978-1- 4503-1442-8/12/05.