Accident Prevention

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--**ABSTRACT**--

This paper proposes a new communication technologies integrated into modern vehicles that offers an opportunity for betterment of people injured in traffic accidents. It reveals an estimation of a novel intelligent system which able to automatically detect road accidents and notify through vehicular network. It is based on the concept of data mining and knowledge influence. It characterizes the vehicle speed, type of vehicle involved and the impact speed. It results in knowledge discovery in database process that allows estimation models to predict the accidents.

I. INTRODUCTION

According to the current trend, the number of expected accidents is destined to increase. When we look up to the statistics of traffic accident all over the world, 853.849 was number of people died in vehicular accident. Roughly 40,000 died in motorized vehicle crash in 2016. By registering a meaningful growth of cars and this number is set to be double up by 2040.

II. PROBLEM STATEMENT

In this paper, we undergo an alternative solution for addressing an issue considering mobile traffic sensor. It is directly installed in private or public transportation. In this scenario big traffic date is fundamental to present accident experiments prove that one system provide an acceptable response time that allow the drivers to receive an alert or warning message to avoid the possible accidents. Everywhere accidents happening so to control all these things we are introducing new set of vehicles.
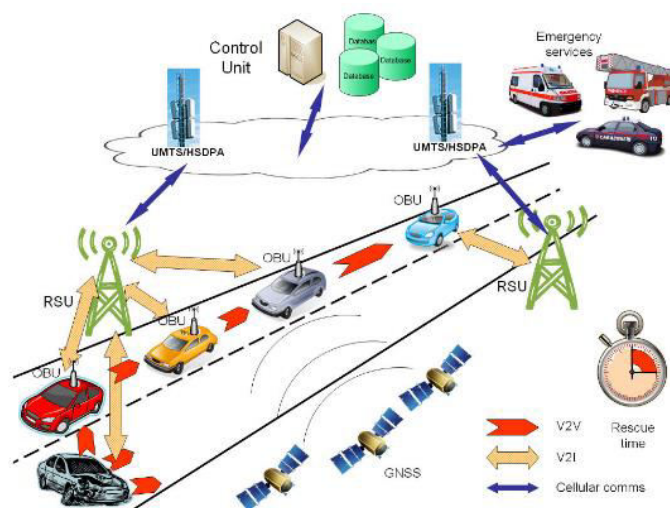
III. SYSTEM CONFIGURATION

3.1. Hardware Specification

Processor	:	Pentium-IV
Speed	:	1.1GHz
RAM	:	512MB
Hard Disk	:	40GB
General	:	Keyboard, Monitor, Mouse

3.2. Software Specification

Operating System	: Windows XP
Front End	: ASP.Net
Programming interface	: C#
Back End	: SQL Server

IV. LITRATURE SURVEY

Title: Optimizing and Post Processing of a Smart Beam former for Obstacle Retrieval

Authors: A. Lay-Ekuakille, P. Vergallo, D. Saracino, A. Trotta

Abstract: Beamforming is one of the most interesting techniques used to know distance systems in order to detect punctual, widespread obstacles. If correctly associated to DOA (Difference of Arrival), it can allow the description of obstacle shape. Distance ranging, for mobile and fixed systems, namely cars, vehicles, vessels and airplanes, that is a key issue for demands of nowadays. Distance between cars and from obstacles can be established and measured using laser and ultrasound. Cloudy and foggy conditions are very important requirements for testing distance ranging facilities. If based on acoustic waves, they can be easily integrated by sophisticated on-board software in order to perform new features. This research presents interesting aspects of defining new requirements for an acoustic scanning capable of reconstructing fixed obstacle features by targeting them using a special array of sensors. The term "acoustic scanning" is intended here as an aspect of sound ranging and reproduction regarding spatial locations of the obstacle, that is spatial shaping. The paper illustrates first

an experimental system from which it is possible to derive parameters for setting spatial shaping of scenarios and after a clear identification of DOAs.

Advantages:
- Connected Infrastructure combine industry-leading customer advocacy, design, and support teams, for a comprehensive approach to the network.
- Connected Infrastructure delivers maximum performance, time savings, space optimization, superior customer experience and sustainability by design, to address challenges.
- IoT saves a lot of time by automating the tasks which are otherwise very time-consuming.
- IoT Applications can provide personal assistants who can alarm on your everyday plans.

Disadvantages:
- There is always the possibility of hackers breaking into the system and stealing the data. And one might want some personal space in life.
- It staying connected with family and friends always giving them every detail of our life activity is not good. There is every possibility of misusing your information.

Title: Beamforming-Based Acoustic Imaging for Distance Retrieval

Authors: A. Lay-Ekuakille, A. Trotta, G. Vendramin,

Abstract: Beamforming is one of the ultimate opportunity to improve distance systems in order to detect punctual and widespread obstacles. Distance ranging for mobile and fixed systems, namely, cars, vehicles, vessels and airplanes, is a key issue for nowadays demands. Distance between cars and from obstacles can be established and measured using laser and ultrasound. Cloudy and foggy conditions are utmost requirements for testing distance ranging facilities. If based on ultrasound, they can be easily integrated by a sophisticated on-board software in order to perform new features. This paper introduces interesting aspects of defining new requirements for an acoustic imaging capable of reconstructing obstacle features by targeting it using a special array of sensors.

Advantages:
- IoT is connecting people to work, home and health smartly so productivity and efficiency can be increased, monitoring and security of homes can be enhanced and health problems can be identified and solved on time.

Disadvantages:
- Our lives will be completely handled by technology and will be dependent on it. The younger generation is already addicted to technology for every little thing and going towards a lazy environment.

Title: Big vehicular traffic Data mining: Towards accident and congestion prevention

Authors: H. Al Najada, I. Mahgoub

Abstract: In 2013, 32,719 people died in traffic crashes in the USA. Almost 90 people on average lose their lives every day and more than 250 are injured every hour. Road safety could be enhanced by decreasing the traffic crashes. Traffic crashes cause traffic congestion as well, which has become unbearable, especially in mega-cities In addition, direct and indirect loss from traffic congestion only is over $124 billion. The existence of the Big Data of traffic crashes, as well as the availability of Big Data analytics tools can help us gain useful insights to enhance road safety and decrease traffic crashes. In this paper we use H2O and WEKA mining tools. We apply the feature selection techniques to find the most important predictors. In addition, we tackle the problem of class imbalance by employing bagging and using different quality measures. Furthermore, we evaluate the performance of five classifiers to: (1) Conduct Big Data analysis on a big traffic accidents dataset of 146322 examples, find useful insight and patterns from the data, and forecast possible accidents in advance (2) Conduct Big Data analysis on a big vehicular casualties dataset of 194477 examples, to study the driver's behavior on the road. From the driver's behavior mining we can predict the driver age, sex as well as the accident severity. The aforementioned analyses, can be used by decision makers and practitioners to develop new traffic rules and policies, in order to prevent accidents, and increase roadway safety.

Advantages:
- Using IoT in aviation, maritime, rail and roadways can improve safety, lower cost for greater scale, make transportation more secure and enable smart choices.
- IoT helps to monitor things in the real time. We can know the availability of things instantly and track them whatever and whenever we want.

Disadvantage:
- The younger generation is already addicted to technology for every little thing and going towards a lazy environment.
- people who are working in lower like Security guard, House servant, laundry service may have lost their occupation.

Title: Decoding techniques for SSR Mode S signals in high traffic environment

Authors: G. Galati, M. Gasbarra, E. G. Piracci,

Abstract: SSR (secondary surveillance radar) exploitation in high traffic environment calls for enhancing surveillance and communication capacity. In the multilateration applications, the use of omni directional (or, anyway, wide beam) antennas and the presence of both SSR Mode S replies and squitter make the superimposition of 1090 MHz signals probable, without mentioning the presence of Modes A/C signals on the

same band. These limitations in SSR signal analysis and decoding, can be mitigated by using both classical (i.e. linear) algorithms and by exploiting the super resolution algorithms capability to discriminate signals in the frequency domain. This work summarizes the results obtained by the application of both classical and super resolution (i.e. Music, Esprit) algorithms to decode overlapped Mode S replies and squitter acquired in a live environment. Moreover, it is recognized that the main limit for super resolution is represented by the "too high" quality of the on board transponder local oscillator which causes a too small spectral separation between two overlapped signals, and a possible solution is presented for vehicles

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Disadvantages:
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Title: IoT in connected vehicles: Challenges and issues

— A review

Authors: Y. U. Devi, M. S. S. Rukmini,

Abstract: In the present modern world, intelligent transportation is a necessary infrastructure. The scenario of intelligent transportation can be viewed by integrating IoT and cloud with connecting vehicular technology. Though the concept of connected vehicles, talking cars, driver-less cars exists from many years, research and development is still in progress. The important performance issues include road safety, comfortable drive, maximizing fuel efficiency, reduction in traffic congestion and accidents. This paper presents the review of challenges and issues in connected vehicles. It also describes the current research directions with IoT in connected vehicles.

Advantages:

- There is a large amount of automation and control in the workings. Without human intervention, the machines are able to communicate with each other leading to faster and timely output.
- IoT Applications can provide personal assistants who can alarm on your everyday plans.

Disadvantages:
- people who are working in lower like Security guard, House servant, laundry service may have lost their occupation.

- The younger generation is already addicted to technology for every little thing and going towards a lazy environment.

Title: Integration challenges of intelligent transportation systems with connected vehicle, cloud computing, and internet of things technologies

Authors: J. A. Guerrero-Ibanez, S. Zeadally, J. Contreras-Castillo

Abstract: Transportation is a necessary infrastructure for our modern society. The performance of transportation systems is of crucial importance for individual mobility, commerce, and for the economic growth of all nations. In recent years modern society has been facing more traffic jams, higher fuel prices, and an increase in CO_2 emissions. It is imperative to improve the safety and efficiency of transportation. Developing a sustainable intelligent transportation system requires the seamless integration and interoperability with emerging technologies such as connected vehicles, cloud computing, and the Internet of Things. In this article we present and discuss some of the integration challenges that must be addressed to enable an intelligent transportation system to address issues facing the transportation sector such as high fuel prices, high levels of CO_2 emissions, increasing traffic congestion, and improved road safety.

Advantages:
- IoT saves a lot of time by automating the tasks which are otherwise very time-consuming. IoT Applications can provide personal assistants who can alarm on your everyday plans.
- Due to physical objects getting connected and controlled digitally and centrally with wireless infrastructure, there is a large amount of automation and control in the workings
- The machines are able to communicate with each other leading to faster and timely output.

Disadvantages:
- The Automation of IoT will have a devastating impact on the employment prospect of less educated workers. people who are working in lower like Security guard, House servant, laundry service may have lost their occupation.

Title: Intelligence transportation service using Vehicular Cloud Network

Authors: A. B. Abhale, S. A. Khandelwal

Abstract: Today transportation play important role and have major economic sector of world. In contrast, increase in number of vehicles can increase number of road accidents and human fatalities. In addition, we are facing traffic problem also. Under this condition, it is necessary to provide promising solution to prevent an accident and

traffic on road. Vehicular cloud network is help to maintain the communication between vehicles and road side units. Vehicular cloud network is a hybrid solution for maintaining traffic information and providing road safety. In this paper, we focus on vehicular cloud network and provide simulation result explore the working of propose methodology.

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Disadvantages:
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Title: Characterizing the role of vehicular cloud computing in road traffic management

Authors: Ahmad, R. M. Noor, I. Ali, M. Imran, A. Vasilakos

Abstract: Vehicular cloud computing is envisioned to deliver services that provide traffic safety and efficiency to vehicles. Vehicular cloud computing has great potential to change the contemporary vehicular communication paradigm. Explicitly, the underutilized resources of vehicles can be shared with other vehicles to manage traffic during congestion. These resources include but are not limited to storage, computing power, and Internet connectivity. This study reviews current traffic management systems to analyze the role and significance of vehicular cloud computing in road traffic management. First, an abstraction of the vehicular cloud infrastructure in an urban scenario is presented to explore the vehicular cloud computing process. A taxonomy of vehicular clouds that defines the cloud formation, integration types, and services is presented. A taxonomy of vehicular cloud services is also provided to explore the object types involved and their positions within the vehicular cloud. A comparison of the current state-of-the-art traffic management systems is performed in terms of parameters, such as vehicular ad hoc network infrastructure, Internet dependency, cloud management, scalability, traffic flow control, and emerging services. Potential future challenges and emerging technologies, such as the Internet of vehicles and its incorporation in traffic congestion control, are also discussed. Vehicular cloud computing is envisioned to have a substantial role in the development of smart traffic management solutions and in emerging Internet of vehicles.

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Title: The Need of a Hybrid Storage Approach for IoT in PaaS Cloud Federation

Authors: M. Fazio, A. Celesti, M. Villari, A. Puliafito

Abstract: Monitoring activities over many different types of sensors are very challenging to support advanced services for Internet of Things (IoT) and its future. However, one of the major issues is the explosion of the amount of heterogeneous information that has to be stored and processed, thus causing the well-known Big Data problem. Some Cloud strategies have been investigated to offer IoT-oriented services, but they do not specifically address solutions for Big Data management. In this paper, we present a two-layer architecture based on a hybrid storage system able to support a Platform as a Service (PaaS) federated Cloud scenario. The proposed architecture combines the benefits of both storage approaches. In particular, it allows us on one hand to extend SQL-like legacy systems, and on the other hand to manage Big Data through an XML-like, non-SQL distributed storage system according to a Cloud federation approach.

Advantages:
- Due to physical objects getting connected and controlled digitally and centrally with wireless infrastructure, there is a large amount of automation and control in the workings.
- Without human intervention, the machines are able to communicate with each other leading to faster and timely output.

Disadvantages:
- Our lives will be completely handled by technology and will be dependent on it.
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Title: Exploring Container Virtualization in IoT Clouds

Authors: A. Celesti, D. Mulfari, M. Fazio, M. Villari, A. Puliafito,

Abstract: The advent of both Cloud computing and Internet of Things (IoT) is changing the way of conceiving information and communication systems. Generally, we talk about IoT Cloud to indicate a new type of distributed system consisting of a set of smart objects, e.g., single board computers running Linux- based operating systems, interconnected with a remote Cloud infrastructure, platform, or software through the Internet and able to provide IoT as a Service (IoTaaS). In this context, container-based virtualization is a lightweight alternative to the hypervisor-based approach that can be adopted on smart objects, for enhancing the IoT Cloud service provisioning. In particular, considering different IoT application scenarios, container-based virtualization allows IoT Cloud providers to deploy and customize in a flexible fashion pieces of software on smart objects. In this paper, we explore the container-based virtualization on smart objects in the perspective of a IoT Cloud scenarios analyzing its advantages and performances.

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REFERENCE

[1] Real Time Traffic Accident Statistics, Sep. 2017, [online] Available: http://www.icebike.org/real-time-traffic-accident-statistics. Show Context

[2] NSC Motor Vehicle Fatality Estimates. Statistics Department National Safety Council(NSN), Sep. 2017, [online] Available: http://www.nsc.org/NewsDocuments/2017/12-month-estimates.pdf.Show Context

[3] Number of Passenger Cars and Commercial Vehicles in Use Worldwide From 2006 to 2015 in (1000 Units), Sep. 2017, [online] Available: https://www.statista.com/statistics/281134/number-of-vehicles-in-use-worldwide.Show Context

[4] The Number of Cars Worldwide is Set to Double by 2040, Sep. 2017, [online] Available: https://www.weforum.org/agenda/2016/04/the-number-of-cars-worldwide-is-set-to-double-by-2040.Show Context

[5] 5. 2016 Road Safety Statistics: What is Behind the Figures?, Sep. 2017, [online] Available: http://europa.eu/rapid/press-release_MEMO-17-675_en.htm.Show Context

[6] A. Lay-Ekuakille, P. Vergallo, D. Saracino, A. Trotta, "Optimizing and post processing of a smart beamformer for obstacle retrieval", IEEE Sensors J., vol. 12, no. 5, pp. 1294-1299, May 2012.Show Context View Article Full Text: PDF (1092KB)

[7] A. Lay-Ekuakille, A. Trotta, G. Vendramin, "Beamforming-based acoustic imaging for distance retrieval", Proc. IEEE Instrum. Meas. Technol. Conf., pp. 1466-1470, May 2008.Show Context View Article Full Text: PDF (3435KB)

[8] H. Al Najada, I. Mahgoub, "Big vehicular traffic data mining: Towards accident and congestion prevention", Proc. Int. Wireless Commun. Mobile Comput. Conf. (IWCMC), pp. 256-261, Sep. 2016.Show Context

[9] 9. G. Galati, M. Gasbarra, E. G. Piracci, "Decoding techniques for SSR Mode S signals in high traffic environment", Proc. Eur. Radar Conf. EURAD, pp. 383-386, Oct. 2005.Show Context

[10] 10.P. Vergallo, A. Lay-Ekuakille, D. Caratelli, "Sparsity of the field signal-based method for improving spatial resolution in antenna sensor array processing", Prog. Electromagn. Res., vol. 142, pp. 369-388, 2013.Show Context CrossRef Google Scholar

[11] 11. A. Lay-Ekuakille, N. I. Giannoccaro, S. Casciaro, F. Conversano, R. Velazquez, "Modeling and designing a full beamformer for acoustic sensing and measurement", Int. J. Smart Sens. Intell. Syst., vol. 10, no. 3, pp. 718-734, 2017.Show Context CrossRef Google Scholar

[12] 12. I. Ahmad, R. Noor, I. Ali, M. A. Qureshi, "The role of vehicular cloud computing in road traffic management: A survey" in Future Intelligent Vehicular Technologies, Springer, vol. 185, pp. 123-131, 2017, [online] Available: https://link.springer.com/chapter/10.1007/978-3-319-51207-5_12.Show Context CrossRef Google Scholar

[13] 13. I. Ahmad, R. M. Noor, I. Ali, M. Imran, A. Vasilakos, "Characterizing the role of vehicular cloud computing in road traffic management", Int. J. Distrib. Sensor Netw., vol. 13, pp. 1-14, Apr. 2017.Show Context CrossRef Google Scholar

[14] 14. Y. U. Devi, M. S. S. Rukmini, "IoT in connected vehicles: Challenges and issues—A review", Proc. Int. Conf. Signal Process. Commun. Power Embedded Syst. (SCOPES), pp. 1864-1867, Oct. 2017.Show Context

[15] 15. J. A. Guerrero-Ibanez, S. Zeadally, J. Contreras-Castillo, "Integration challenges of intelligent transportation systems with connected vehicle cloud computing and Internet of Things technologies", IEEE Wireless Commun., vol. 22, no. 6, pp. 122-128, Dec. 2015.Show Context View Article Full Text: PDF (424KB)

[16] 16. F. Lin, Q. Huang, Q. Tan, "Distributed storage video cloud of intelligent transportation system based on the backward cloud generator", Adv. Transp. Stud., vol. 2, pp. 15-22, 2015.Show Context

[17] 17. Y.-W. Lin, J.-M. Shen, H.-C. Weng, "Cloud-supported seamless Internet access in intelligent transportation systems", Wireless Pers. Commun., vol. 72, no. 4, pp. 2081-2106, Oct. 2013.Show Context CrossRef Google Scholar

[18] 18.B.-J. Chang, Y.-L. Tsai, Y.-H. Liang, "Platoon-based cooperative adaptive cruise control for achieving active safe driving through mobile vehicular cloud computing", Wireless Pers. Commun., vol. 97, no. 4, pp. 5455-5481, Dec. 2017.Show Context CrossRef Google Scholar

[19] 19. A. B. Abhale, S. A. Khandelwal, "Intelligence transportation service using vehicular cloud network", Proc. IEEE Int. Conf. Adv. Electron. Commun. Comput. Technol. (ICAECCT), pp. 277-282, Dec. 2017.Show Context

[20] 20. N. Fida, F. Khan, M. A. Jan, Z. Khan, "Performance analysis of vehicular adhoc network using different highway traffic scenarios in cloud computing" in Future Intelligent Vehicular Technologies, Springer, vol. 185, pp. 157-166, 2017, [online] Available: https://link.springer.com/chapter/10.1007/978-3-319-51207-5_15.Show Context CrossRef Google Scholar

[21] 21. M. Fazio, A. Celesti, M. Villari, A. Puliafito, "The need of a hybrid storage approach for IoT in PaaS cloud federation", Proc. 28th Int. Conf. Adv. Inf. Netw. Appl. Workshops, pp. 779-784, 2014.Show Context View Article Full Text: PDF (446KB)

[22] 22. A. Celesti, D. Mulfari, M. Fazio, M. Villari, A. Puliafito, "Exploring container virtualization in IoT clouds", Proc. IEEE Int. Conf. Smart Comput. (SMARTCOMP), pp. 1-6, May 2016.Show Context

[23] 23.A. Celesti, M. Fazio, M. Giacobbe, A. Puliafito, M. Villari, "Characterizing cloud federation in IoT", Proc. 30th Int. Conf. Adv. Inf. Netw. Appl. Workshops (WAINA), pp. 93-98, Mar. 2016.