Literature survey

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Literature survey on signs with smart connectivity for better road safety:

1.Reliable Smart Road Signs: Author: Muhammed O. Sayin, Chung-Wei Lin, Eunsuk Kang, Shinichi Shiraishi, Tamer Basar Date of conference: 16 October 2019

Conference Location: IEEE Transactions on Intelligent Transportation Systems

In this paper, they propose a game theoretical adversarial intervention detection mechanism for reliable smart road signs. A future trend in intelligent transportation systems is "smart road signs" that incorporate smart codes (e.g., visible at infrared) on their surface to provide more detailed information to smart vehicles. Such smart codes make road sign classification problem aligned with communication settings more than conventional classification. This enables us to integrate well-established results in communication theory, e.g., error-correction methods, into road sign classification problem. Recently, vision-based road sign classification algorithms have been shown to be vulnerable against (even) small scale adversarial interventions that are imperceptible for humans. On the other hand, smart codes constructed via errorcorrection methods can lead to robustness against small scale intelligent or random perturbations on them. In the recognition of smart road signs, however, humans are out of the loop since they cannot see or interpret them. Therefore, there is no equivalent concept of imperceptible perturbations in order to

achieve a comparable performance with humans. Robustness against small scale perturbations would not be sufficient since the attacker can attack more aggressively without such a constraint. Under a game theoretical solution concept, they seek to ensure certain measure of guarantees against even the worst case (intelligent) attackers that can perturb the signal even at large scale. they provide a randomized detection strategy based on the distance between the decoder output and the received input, i.e., error rate. Finally, they examine the performance of the proposed scheme over various scenarios.

2.Telematics and Road Safety:

Author: Sivaramalingam Kirushanth, Boniface Kabaso.

Date of conference:24 July 2018

Conference Location:2018 2nd International Conference on Telematics and Future Generation Networks (TAFGEN).

 In this they proposed that, Road Safety is a major concern around the world. Telematic solutions have been available for more than a decade, and several studies have been done in the use of telematics data in road safety. However, these studies are scattered on different topics. There is a need to find the best possible ways of using telematics data for safe driving. This paper presents the review made with the aim of finding the evidence on the effective use of telematics data for road safety. Summary of the data collection devices, sensors, features, algorithms, feedback types used are discussed in this paper.   In the last they conclude that, more studies on presenting effective feedback techniques are needed. An efficient way of detecting who is using the phone while driving is a challenging task to be further studied. Only a few studies on total road safety monitoring, which covered driver, vehicle, and road anomaly, has been done so far. Since there are different types of features used in each study, performing a metaanalysis is challenging task.

3.Enhancing V2V network connectivity for road safety by platoon based VANETs:

Author: Chunxiao li, Dawei he, Anran zhen, Jn sun, Xuelong hu

Date of conference: 08 January 2017

Conference Location:2017 IEEE International Conference on Consumer Electronics (ICCE)

In this paper they proposed that vehicular ad-hoc networks (VANETs), road services related messages are propagated by vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) communications. So, the connectivity of VANETs is one key factor to ensure the successfully message dissemination. However, due to the dynamic changing topology of VANETs, the lifetime of the links between vehicles is short. Therefore, it is necessary to enhance the network connectivity for efficient message dissemination. In this paper, we propose a connectivity probability enhancing scheme by platoons, which also has considered the minimum safety distance between adjacent vehicles. The simulation results indicate the connectivity probability is always higher than those without platoons.   In this paper, they have designed a connectivity probability enhancing scheme by the platoons, which also has considered the influences of the minimum safety distance between adjacent vehicles to ensure road safety. The simulation results indicate that the network connectivity probability can be enhanced when there are platoons in a network. Besides, the minimum safety distance cannot be ignored when design the network connectivity models for avoiding crashes.

4.Smart Road Accident Detection and communication System:

Author: Nagarjuna R. Vatti; Prasanna Lakshmi Vatti; Rambabu Vatti; Chandrashekhar Garde.

Date of conference: 01 March 2018

Conference Location:2018 International Conference on Current Trends

towards Converging Technologies (ICCTCT)

 In this paper they proposed that, The number of fatal and disabling road accident are increasing day by day and is a real public health challenge. Many times, in the road accidents, human lives will be lost due to delayed medical assistance. Hence road accident deaths are more prominent. There exist many accident prevention systems which can prevent the accidents to certain extent, but they do not have any facility to communicate to the relatives in case accident happens. In this paper, the authors made an attempt to develop a car accident detection and communication system which will inform the relatives, nearest hospitals and police along with the location of the accident. In the last they concluded that, Smart Road accident and communication system has been developed. Experiments have been conducted by implementing the system in a toy car. It is observed that the system is working properly. The system sends the message to the stored emergency numbers successfully when the car is collided and toppled or tilted by more than 30 degrees and if the reset button is not pressed in the stipulated time interval. Future scope: An android app can be developed for this in which instead of just receiving the co-ordinates of the location, it can be exactly pin pointed on the map. The heart rate can also be continuously monitored by the app to determine the driver's condition till the medical help arrives.

5.Internet-of-Things-Based Smart Transportation Systems for Safer Roads: Author: Mohammad Derawi, Yaser Dalveren, Faouzi Alaya Cheikh. Date of Conference: 02-06-2020 Conference Location: New Orleans, LA, USA

 From the beginning of civilizations, transportation has been one of the most important requirements for humans. Over the years, it has been evolved to modern transportation systems such as road, train, and air transportation. With the development of technology, intelligent transportation systems have been enriched with Information and Communications Technology (ICT). Nowadays, smart city concept that integrates ICT and Internet-of-Things (IoT) have been appeared to optimize the efficiency of city operations and services. Recently, several IoT-based smart applications for smart cities have been developed. Among these applications, smart services for transportation are highly required to ease the issues especially regarding to road safety. In this context, this study presents a literature review that elaborates the existing IoT-based smart transportation systems especially in terms

of road safety. In this way, the current state of IoT-based smart transportation systems for safer roads are provided. Then, the current research efforts undertaken by the authors to provide an IoT-based safe smart traffic system are briefly introduced. It is emphasized that road safety can be improved

using Vehicle-to- Infrastructure (V2I) communication technologies via the cloud (Infrastructure-to-Cloud – I2C). Therefore, it is believed that this study offers useful information to researchers for developing safer roads in smart cities.