LITERATURE REVIEW

SIGNS WITH SMART CONNECTIVITY FOR BETTER

ROAD SAFETY OF IOT

INTRODUCTION :

Technology has brought fine changes into every portion of our life by making it smart and reli-able. There are many situations in which technologies can be used to avoid accidents in roads which opens a wide window for the requirement of Smart Road System. With the dynamic changes in the models of the vehicles the roads need to have same ability to face them. Evolving towards the future, the roads needs to build with advanced sensors and antenna systems to have a pace with the new era. The design involves the road side units and vehicle side units as part of intelligent transport system involving Internet of things(IOT).

This project has desighned a system to alert the driver about the speed limits in specific areas by reducing the speed of the vehicles in sensitive public zones without any interference of the drivers where controls are taken automatically by the use of a wireless local area network. The main objective of the proposed system is to operate the vehicles in a safe speed at critical zones minimizing the possible risk of unwitting accidents and casualties. Besides, the system is capable of detecting the accidents and give notification to the control room. The system operates in such way that the accident information is passed to the vehicles entering the same zone to take diversion to avoid traffic congestion.

LITERATURE REVIEW:

S.NO	TITLE	AUTHOR	SOURCE	SUMMARY POINTS
1.	**Smart Roadside System for Driver Assistance and Safety Warnings: Framework and Applications**	Jeong Ah Jang *, Hyun Suk Kim and Han Byeog Cho	Article	• This paper has presented a framework for a smart roadside system and sensors such as infrastructure-base sensors and OBDII-based vehicle sensors • The mainservices for the two road types are a red-light violation warning system at signalized intersections and an advisory speed provisioning system on highways • Under the given real-time application for drivers, the framework and certain algorithms produce a very efficient solution with respect to roadway type features and sensor type use • In reality, this service may be used in future roadway systems. After the installation and operation of various road and vehicle sensor systems, the qualitative and quantitative effects and benefits of this system can be demonstrated • Although this research is limited to certain sectors, the results of this paper demonstrate the feasibility of applying this new service system using infrastructure-based sensors and OBDII-based vehicle sensors
2.	**Reliability Engineering and System Safety**	Eetu Wallius *, Ana Carolina Tom´e Klock , Juho Hamari	journal	• This article synthesized the state-of-the-art of motivational technologies in transportation safety, provided design guidelines and identified promising avenues for future research through a systematic review. • Limitations of the analysis phase relate to the incomplete de-scriptions of the interventions applied in the reviewed studies, as only the affordances mentioned in the manuscripts were considered • We suggest future work in the domain to cover a broader scope of transportation modes, go beyond the person approach to error man-agement by exploring how motivational technologies can aid in

				enhancing transportations safety thorugh system design
3	**An IoT Architecture for Assessing Road Safety in Smart Cities**	Abd-Elhamid M. Taha	Article	• This work illustrates the viability of an economic road safety monitoring and assessment solution through exploiting advances in the Internet of Things (IoT) within the context of smart cities. • The introduced architecture facilitates robust and dynamic road safety assessment that complements the Safe System approach motivated by the World Health Organization (WHO) • Future work involves exploring further applications, especially in the context of raising driver awareness of the road safety conditions during their trips.
4.	**Reliable Smart Road Signs**	Muhammed O. Sayin, Chung-Wei Lin, Eunsuk Kang, Shinichi Shiraishi, and Tamer Bas,ar	Article	• A future trend in intelligent transportation systems is smart road signs equipped with smart codes. • In addition to incor-porating relatively larger amount of information, smart codes constructed via error-correction methods can provide robust-ness against small scale perturbations • A network of smart vehicles can lead to more reliable traffic networks. Particularly, a detection mechanism faces a trade-off between detecting an adversarial intervention and avoiding false alarms. Since a road sign would be encountered by multiple smart vehicles, those vehicles can share the false alarm cost against an attack on the road sign. Similar to herd immunity [38], a herd of smart vehicles can achieve more reliable road sign recognition. • Additionally, this approach can also be a good fit for other classification problems that can be viewed as a signaling problem, where we can incorporate visual smart codes while transmitting information.
5.	**Development and Testing of Road Signs Alert System Using a Smart Mobile Phone**	Eric M. Masatu , Ramadhani Sinde , and Anael Sam	Article	• Road accidents cannot be eliminated but can be reduced by enhancing the safety of the drivers. • This study developed a smart mobile-based application that uses in-built sensors to alert drivers with voice and image notifications. The ap-plication provides a voice alert to a needed action that enhances the driver's attention.

				• The smartphone is used to avoid the need for onboard devices to detect and recognize road signs, sensors on road infrastructure, and the use of WLAN. We have used the Haversine formula for measuring and estimating the distance between two pairs of Co ordinates
6.	**mproving Road Safety with Intelligent Transportation Systems**	Kelly Borden, Marc LaBahn, Matt Milliken, Solomon Ortega	Article	• Over the course of this project, we collected ITS solutions into a toolbox, identified hotspots using ArcGIS, and proposed solutions to these hotspots based on our research into ITS solutions. • ITS toolbox can be used by DOTs all over the country as a resource for ITS solutions. Traffic safety is an issue in the state of New Mexico. It is above the national average for traffic fatalities per 100,000 population
7.	**Effect of Road Markings and Traffic Signs Presence on Young Driver Stress Level, Eye Movement and Behaviour in Night-Time Conditions: A Driving Simulator Study**	Darko Babic,Dario Babic,*Hrvoje Cajner, Ana Sruk and Mario Fiolic.	Article	• A limited amount of visual information available to the driver, reduced and narrowed field of vision as well as the impaired ability and accuracy of perception of colour, shape, texture, contrast and movement, result in an increased risk of road accidents during night-time driving • Drove considerably slower and more stably in terms of lateral positioning of the vehicle during driving. • More actively visually examined the surroundings of the road, the accompanying road elements and traffic signalling. • Adjusted their behaviour to the upcoming situation, i.e., to the information received through traffic signalling. • Made significantly less mistakes that resulted in road accidents. • Felt less stress during driving, which ultimately resulted in a more comfortable and safer ride. Considering all the above, this study provides a clear confirmation of the importance of traffic
8.	**IoT Based Smart Road Safety and Vehicle Accident Prevention System for Mountain Roads**	Kailas Shindea, Pranjal Shindeb, Shivani Valhvankarc, Swapnil Narkheded	Article	• The motive of this project is to decrease the quantity of accidents in curve roads. This can be done by alerting the driving force by means that of junction rectifier light-weight that glows once vehicle comes from the opposite aspect of the curve. • The vehicle is detected by the assistance of inaudible sensing element that is interfaced to the microcontroller Arduino Nano.

				• Furthermore, still in the event that mishap occurs, cautioning cherished one by causation message and arrangement of the unplanned spot misuse GSM module, GPS module and Arduino Uno. By this we will save thousands of lives within the curve roads
9.	**Benefits and Challenges of Smart Highways for the User**	Gesa Wiegand fortiss GmbH LMU Munich Munich, Germany	Article	• Smart infrastructure provides great potential for users of the road. Facing new technology such as autonomous cars, connected cars, brought-in devices or platooning the users of the highway will have different levels of autonomy. • Therefore a perfectly controlled traffic flow is not possible. By providing all users with information independent of their vehicles' abilities, a shared knowledge base is created. • This knowledge base can be retrieved by the system itself but also by the driver on the highway. A brought-in device such as a phone or tablet, for example, can retrieve information like the accurate traffic situation on the highway. • his provides the user of the infrastructure system with more traffic information in order to improve the safety of the drivers on the road.
10.	**Smart Vehicle Connectivity for Safety Applications**	Usha Devi Gandhi, Arun Singh, Arnab Mukherjee and Atul Chandak	Article	• In this paper, we proposed to design Vehicle communication management protocols using vehicle-to-vehicle communication to address these core issues of safety. • We believe that accidents can be diminished and endured altogether utilizing V2V technology. • Since installation of wireless environment at every cross point would be costly.
11.	**Smart Road Safety and Landslide Detection System**	Mr. Krishnendu Biswas1, Ms. Nayan Kamble2, Mr. Ashish Arbat3, Mr. Arnav Khandekar4	Journal	• his system is developed using ATMega328, Arduino processor. In the transmitter section we have sensors connected to Arduino which is further connected to Power supply if any sensor detected any disturbance then it transmits signal to receiver and it displays in LCD at receiver. By using the detection system we can take prevention and save the life and properties of humans.

CONCLUSION :

A future trend in intelligent transportation systems is smart road signs equipped with smart codes. In addition to incor-porating relatively larger amount of information, smart codes constructed via error-correction methods can provide robust-ness against small scale perturbations. We have introduced a game theoretical adversarial intervention detection mechanism for reliable smart road signs against threats that can perturb the smart codes at small or large scales intelligently. While designing the detection mechanism, we have considered mul-tiple performance metrics regarding the cost associated with losing the opportunity of preventing future attacks by not being able to detect the attack, the cost associated with adversary-induced decoding error or failure, the false alarm cost, and the ease of a deceptive perturbation. We have designed the detection rule against the worst-case attacker who maximizes the cost metrics by knowing the designed defense, i.e., under the solution concept of Stackelberg equilibrium where the defender is the leader. We have provided a relaxation on the attacker's strategy space in order to mitigate possible computational issues that might arise while computing the equilibrium when there is a large number of distinct road signs. This has enabled us transform the problem into an LP with considerably small computational complexity. Finally, we have examined the performance numerically over various scenarios.

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