1.Title: Adaptive security mechanisms for safety applications in Internet of Vehicles

Author: Muhammad Awais Javed; Elyes Ben Hamida
Year:2016.

Description:

Internet of Vehicles (IoV) is an important constituent of next generation smart cities that enables city wide connectivity of vehicles for traffic management applications. A secure and reliable communications is an important ingredient of safety applications in IoV. While the use of a more robust security algorithm makes communications for safety applications secure, it could reduce application QoS due to increased packet overhead and security processing delays. Particularly, in high density scenarios where vehicles receive large number of safety packets from neighborhood, timely signature verification of these packets could not be guaranteed. As a result, critical safety packets remain unverified resulting in cryptographic loss. In this paper, we propose two security mechanisms that aim to reduce cryptographic loss rate. The first mechanism is random transmitter security level section whereas the second one is adaptive scheme that iteratively selects the best possible security level at the transmitter depending on the current cryptographic loss rate. Simulation results show the effectiveness of the proposed mechanisms in comparison with the static security technique recommended by the ETSI standard.

2. Title: Controlling of Smart Movable Road Divider and Clearance Ambulance Path Using IOT Cloud

Author: Sonal Agrawal; Prakhar Maheshwari

Year:2021

Description:
Smart moveable road divider system help to clearing the traffic on road during peak hours of the day and whenever any ambulance stuck in traffic it will automatically recognize the ambulance and clearing the path using this device. This system works where traffic on the ingoing side is more as compared to other outgoing side or vice-versa because traffic on one side is more than the other side then only able to shift the divider otherwise divider can't be shifted. The shifting of the divider is very slowly for safety purposes. Deep learning is used to acquiring the current situation of traffic and these data will store in clouds using cloud computing and big data handling over IOT. Cloud database sends the message to embedded system over IOT protocols to shift the divider left or right.

3. Title: An Intelligent Road Damage Detection System using 5G Integrated Team-forming Network

Author: Md. Arafatur Rahman; Muhammad Afiq Bin Azmi; Nafees Zaman; Muhammad Kamran Naeem; Prashant Pillai; Mohammad Patwary.

Year:2021

Description:
In the era of fifth generation of cellular communication (5G), connected vehicles are expected to play a crucial role in transportation and road safety. Every year, road accidents cause numerous injuries and deaths all over the world. One of the various reasons for these accidents is the damaged roads. However, recent technological advancements have provided us with the opportunity to overcome these challenges and mitigate the number of accidents drastically. Thus, in this manuscript, we developed a cost-effective IoT device to capture information of potholes on the roads and alert the authority through gateways with the aid of our proposed architecture which integrates 5G networks. Experimental investigations have been carried out to test the performance of our model and our findings demonstrate that the proposed device performs significantly well in the testbed with an accuracy of little less than cent percent in team-forming network.

4. Title: Application of IoT and Artificial Intelligence in Road Safety

Author: **Srimantini Bhattacharya**; **Harsh Jha**; **Radhikesh P. Nanda**
Year:2022

Description:
This paper explores the advancement of the Internet of Things (IoT) and Machine Learning in the field of Road Safety and accident prevention with a state-of-the-art review of various techniques adopted for implementing an intelligent road Safety System. In this review, emphasis is given on the behavior of drivers, the condition of vehicles (two-wheelers, four-wheelers), health condition of roads and bridges, and theft-related issues using Radio Frequency Identification (RFID). It is seen that, with the help of IoT, the safety system can be updated on a real-time basis which can help to create a smart, intelligent, and highly efficient Road Safety system. Artificial Intelligence (AI) is applied to enhance the technology further for detecting the driver's behavior like drowsiness with the help of real-time camera feed or high-resolution images. Additionally, the role of AI in detecting the condition of roads and bridges in preventing road accidents is also discussed. Though the paper provides a good insight into the application of IoT and Machine Learning in the smart Road safety system, certain limitations are highlighted.

5. Title: An IoT based Intelligent Transport and Road Safety System

Author: **P. Sharmila**; **J.M Nandhini**; **K. Anuratha**; **Soshya Joshi**
Year:2022

Description:
Road safety is the major issue nowadays there are thousands of road fatalities and injuries due to drive fatigue and drunk and drive. To avoid and reduce these kind of road accidents simple sensors used within a vehicle to do different functions, such as horn control and speed control to manage and control the speed of the vehicle in different places such as flyovers, bridges, highways, schools. The vehicle is controlled on traffic signal when

the signal is red, the vehicle is automatically stopped. The RF transmitter includes four buttons like no horn, speed control, green signal and no parking. This RF transmitter is placed on signal panels that sends the signals to the RF receiver which is connected with NodeMCU. The LCD screen displays the messages by pressing the buttons required by the transmitter.

6. Title: RFID based SMART SCHOOL BUS: Certifying Safety for the Children Going to School on the Road

Author: **Rabinarayan Bhatta**; **Parth Pratim**; **S. Priya**
Year:2021

Description:

It is generally known that, many students travel between school and home on a daily basis. This necessitates the need to address the issue of safer school bus travel, which has become a national concern in India. Some of the issues include the child being left behind in the bus, the bus taking a different route to drop the child off, and so on. This problem has been addressed in this research work by developing a safety system to track the number of children entering and exiting the bus using their ID, and this process will take place with the help of RFID (Radio Frequency Identification) and a GPS tracker, which will be used to track the bus in order to locate its exact location and determine the path in which the bus is travelling. Additionally, the parents will be notified if any unusual activity occurs, such as the changing the bus route or counting the number of students on board. Since, this is an advanced system, the travelling children and the driver do not need to take any additional actions; wherein the system will take care of all the necessary steps and track the students' entry and exit. In the case of the drunk and drive application, if the driver is intoxicated, the sensor will detect it and send a message to the school administration so that they can take appropriate action. Also, the proposed model will check whether students and drivers have properly fastened their seat belts or not. Also, the proposed system will provide panic buttons. In case of any emergency like road accident, the driver can also press the panic button. This module is employed in order to establish the connection between the users and the board. After completing all the process, all the related data will be sent to the parents via a wireless medium. The user interface for the proposed model is IOT application.

7. Title: Road Obstacles Detection using Convolution Neural Network and Report using IoT

Author: **T. Rajendran**; **Mohamed Imtiaz. N**; **Jagadeesh. K**; **Abdul Kareem. D**

Year:2022

Description:

Most of the highways accidents are occurred due to bad road conditions. To minimize the road accidents, fixing the cracks and potholes in the highways can be done. The objective of this work to detect the potholes and road cracks that lie below the ground surface those are called as negative obstacles. The USB camera configuration is used to capture and test with highway road scenes. A new evaluation and comparison method for automatic detection of road cracks has been presented. The collected crack pictures of the road were processed with convolution neural network classifier, the model is simulated with MATLAB. The classified obstacles and location details is reported to highways department by using IoT modules. The obstacles detection using the CNN classifier produced accurate values and the results will be communicated immediately to concern end point.

8. Title: Advanced Internet of Things (IoT) Based Technique for Prevention of Road Accidents

Author: Vasireddy Satish; S. Gowri

Year:2021

Description:

Population in the countries like India is growing very rapidly which results in increase in traffic in cities. WHO (World Health Organization) gave the report of accidents that occurred in the world in 2021 due to the accidents.

As per reports around 50% to 60% of the accident cases are leading to the death of the individual. Many reasons state the cause of accidents. One case states that accident deaths occur majorly with two-wheeler riders due to the head injuries. Another case states that due to the drowsiness of the driver. Alcohol consumption is also the major reason for accidents to occur which might result in the loss of life of a driver. Survey done by road safety department states that majority of road accidental deaths are occurring in youth due to rash driving or driving with alcohol consumption. In this work, an advanced way of dealing with the accidents is proposed which further prevents the accidents to occur. An Internet of Things (IOT) based system is designed in such a way that bike or scooter gets started only the rider wears a helmet and also passes the alcohol test. One more methodology is also added where the alarm system gets ON when the driver reaches the over speed. Sensors and microcontrollers are used in the proposed work.

9. Title: Road Safety in the Age of Mobile Phones: IoT and Milgram

Author: Ali Raza

Year:2017

Description:
In this position paper an approach to reducing road accidents caused by mobile phone use is presented. The use of recent technological advancements in IoT combined with the outcomes of the famous 1963 Milgram experiment focusing on the conflict between obedience to authority and personal conscience is presented. High-risk driving contributes to over 75% of deaths in some countries due to the behavior of the driver. This paper considers the use of a mobile phone causing inattention while driving as a prime risk. Measures by road safety agencies have included the use of high-tech cameras which can detect the use of mobile device. Cost limitations prevent agencies from providing ubiquitous coverage of these devices. This position paper argues that the automotive and mobile devices industries need to play a role to support the road safety agencies. Furthermore, a novel approach to smart road safety using IoT, micro-location and geo-fencing is proposed which discourages mobile phone use and provides a foundation for future research. Recent studies and technological advancements which contribute to aspects of this solution are highlighted in this paper. Finally the approach proposes new standards to be established between vehicle and mobile device manufacturers for a smarter resolution.

10. Title: IoT-driven road safety system

Author: Dasari Vishal; H. Saliq Afaque; Harsh Bhardawaj; T. K. Ramesh

Year:2017

Description:

Roads are integral part of human civilization. They are the nervous system of any country; hence these are being laid on hill sides and narrow ridges which is a major hazard to human life. As roads play a crucial role in our daily routine these can be modelled in a smart manner to serve us with enhanced capabilities. The architecture of IoT is comprised of an ability to make things more coherent and effective. This paper synchronizes the concept of IoT with roads to make them smart. The paper talks about using the IoT technologies, with the onset of smart cities, to reduce the risk of run off road collisions. As every vehicle is IoT enabled and connected to the internet, we have an effective technique to guide emergency service vehicles through the road within least time. This IoT system is a combination of simple cost-effective antenna technology and internet platforms which works with complete automation. These abilities will make the system to serve us with better accuracy and delicacy.

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