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Signs With Smart Connectivity For Better Road Safety

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1. An IoT Architecture for Assessing Road Safety in Smart Cities

Authors : Abd-Elhamid M. Taha

The Safe System (SS) approach to transport networks originated with the "Safe Road Transport System" model developed by the Swedish Transport Agency. In its essence, the approach migrates from the view that accidents are largely and automatically the driver's fault to a view that identifies and evaluates the true causes for accidents. Trough the categorization of safety into the safety of three elements (vehicle, road, and road user), SS minimizes fatalities and injuries by controlling speeds and facilitating prompt emergency response. The model has been widely adopted since its introduction and is currently motivated by the WHO as a basis for road safety planning, policy-making, and enforcement. An illustration of the model is provided in Figure 1. A central emphasis is given to speed in the SS approach as it is the strongest and most fundamental variable in the outcome of fatality. The fragility of the human body makes it unlikely to survive an impact at a speed of more than 30 km/h, with lower speeds resulting in either death or serious injury [3, 4]. The objective of the SS approach is that the three model elements should be designed and monitored to proactively prevent deadly speeds from happening and allow for a reduced emergency response time in the event of an accident. This paper overlooks similar existing systems and examines their advantages and disadvantages. There are a lot of systems that only detects accidents. There has not been a system to prevent and detect accidents at the same time in an efficient manner. This system issuing NB-IoT and GPS. This system detects a vehicle accident using vibration sensor and sends an alert to server for rescue. In this system, there is an accident prevention system. An IoT Approach to Vehicle Accident Detection probability and speed suggestions, Reporting, and navigation, proposed a rescuing process by reporting location of an accident with other information.

2. Approach in Road Safety using IoT Node Mesh

Authors : Sangeeta , Nitin Agarwal

Published Month & Year : April, 2021.

<u>**Project Description**</u> : Presently, the IoT is one among the foremost important and promising technological topics. By 2020, it's estimated that there'll be up to 50.6 billion connected devices [1]. The IoT consists of everyday objects like physical devices, buildings, vehicles with embedded software, electronics, sensors, and network connectivity, that are capable to gather and exchanging data. The IoT is capable of transmitting the info over a network without counting on human-to-machine or human-to-human interaction. The IoT plays an important role in several elds like smart city, smart homes, health-care, banking, and education.In its Global Status Report on Road Safety 2015, the planet Health Organization (WHO) noted that the worldwide total number of road traffic deaths has plateaued at 1.25 million per annum , with tens of million either injured or disabled. Different initiatives, like the United Nations initiative for the 2011-2020 Decade of Action for Road Safety, have led to improvements in road safety policies and enforcements. However, the WHO notes that the progress has been slow and has maintained the decision for urgent action to scale back these The WHO describes different measures which will be implemented with minimal economic impacts in its Save LIVES: Road Safety Technical Package.

WORKING MODULE

- Vehicle system always collect vehicle vitals by built in sensors and process it.

- All vehicles share each others data to node server when approaches.

- If any vehicle get critical condition then it send data to server with priority.

- Node server share this data with other vehicles when they approaches.

3. Smart Roadside System for Driver Assistance and Safety Warnings

Authors : Jeong Ah Jang

__Project Description__ : Telematics are defined as in-vehicle systems that offer active safety and infotainment services as well as location and traffic information via wireless communication technologies. In many countries, a variety of in-vehicle Telematics systems and Intelligent Transport Systems (ITS) are already available, while new systems are being currently designed.

According to plans from the U.S. Department of Transportation, the so-called ITS Strategic Research Plan (2010–2014), IntelliDrive projects dealing with ICT and transportation convergence technologies, including vehicle-to-vehicle (V2V) interaction and vehicle-to-infrastructure (V2I) interaction, are concurrently underway. One of the important items of the ITS Strategic Research Plan is making an intelligent roadside system under a Smart Roadside project, which began in 2008. The vision of a Smart Roadside is a system in which commercial vehicles, motor carriers, enforcement resources, highway facilities, intermodal facilities, toll facilities, and other transportation system nodes collect data for their own purposes. The nodes can then share the data seamlessly with relevant parties in order to improve motor carrier safety, security, operational efficiency, and freight mobility. In Europe, Cooperative Vehicle-Infrastructure Systems (CVIS) projects have been underway since 2006, and are supported by a grant from the European Commission. A precondition of the CVIS projects is that users of cooperative systems be made aware of these systems and understand how they can help drivers operate more safely, economically, and comfortably. Operators should also run their roadway networks in more cost- and eco-effective ways. Here, "cooperative" indicates systems that cooperate on two levels: (1) direct communication and the exchange of valuable information between entities; and (2) dynamic interaction amongst roadway users and transport infrastructure, which can provide win-win benefits for both drivers and roadway operators. The main elements of a high-level CVIS system are the vehicle, roadside system, and central system. In particular, a road side system includes standardized access, secure communication between vehicles and infrastructure, authentication, authorization, updates, and software configuration. Driven by the Korean government, the SMART highway R&D project was recently launched in 2008, and is expected to be completed by 2015. A SMART highway is a future high-speed roadway that supports an intelligent and convenient driving environment by providing roadway, vehicle, environmental, and human information, enabling users to concentrate solely on their driving and helping reduce accident rates.

4. Advances in smart roads for future smart cities

Authors : <u>Chai K. Toh</u>, <u>Julio A. Sanguesa</u>, <u>Juan C. Cano</u>and <u>Francisco J. Martinez</u>

Project Description : Various countries throughout the world have started their efforts in designing and implementing smart cities. China alone has over 300 smart city projects, with strong participation by industries and government offices. India too have allocated trillions in budget to build over 100 smart cities. An essential part of a smart city is transport. In this paper, we will discuss the current state, developments, and some of the emerging advances in transportation technologies and how these advances in smart roads will prepare the society towards the realization of future smart cities. Roads were meant to provide transportation links from one place to another. Without roads, vehicles will have to ride over bumpy surfaces or made long routes instead of direct routes due to obstructions. However, smart roads of the future will be able to do more than just paving the way to destinations. Ideas of using roads to harvest energy have also emerged recently.There are several methods to harvest energy from roads. Some use sunlight (hence the term solar roads while others use mechanical vibrations produced by vehicles as they transverse the road to generate electrical energy. Solar energy captured on roads can be used to power street lights, signage and traffic signals. The energy harvested can also be stored or fed to the electric power grid. This is the point where transportation power grid meets the electricity generation grid, changing the future of the power supply paradigm. For solar roads, photovoltaic modules are placed directly on top of road surfaces to capture sunlight. The energy generated can also be used to light up street dividers during the night and for melting snow.

5. IoT Based Smart Road Safety and Vehicle Accident Prevention System for Mountain Roads

Authors : Kailas Shinde, Pranjal Shinde, Shivani Valhvankar, Swapnil Narkhede
Published Month & Year : May, 2021.

<u>**Project Description**</u> : Within the upgrading countries, the accident is that the major reason for death. If we tend to remark dangerous roads within the world then all of them area unit mountain roads and curvy roads. The intensity of the deaths area unit additional in incurved roads. Within the mountain roads, there'll be slim roads with tight curves. In such forms of things, the driving force of a vehicle cannot see vehicles coming back from the alternative aspect. as a result of this downside, thousands of individuals lose their lives every year. Whereas we tend to area unit talking regarding mountain roads here alternative aspect can because of a drop-off. The answer for this downside is alerting the driver regarding the vehicle coming back from an alternative aspect. One among the answer is planned during this paper. We will alert the driver by inserting an inaudible sensing element in one aspect of the road before the curve and keeping the junction rectifier light-weight alternative aspect of the curve, so if the vehicle comes from one finish of the curve sensing element can sense the vehicle and junction rectifier light-weight glows at the other aspect as Red. By gazing at the Red junction rectifier light-weight driver will become alert and might prevent the speed of the vehicle. Still, if an associate accident happens we will save the life of the victim by giving medical help like a shot. This will increase the survival probabilities of victims.