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| Date | 30 August 2022 |
| Team Id | PNT2022TMID41909 |
| Project Name | Sings With Smart Connectivity for Batter Road Safety |

Literature Survey

A)Development and Testing of Road Signs Alert System Using a Smart Mobile Phone

Road traffic accident is a major problem worldwide resulting in significant morbidity and mortality. Advanced driver assistance systems are one of the salient features of intelligent systems in transportation. They improve vehicle safety by providing real-time traffic information to the driver. Road signs play an important role in road safety. To be effective, road signs must be visible at a distance that enables drivers to take the necessary actions. However, static road signs are often seen too late for a driver to respond accordingly. In this study, a system for alerting drivers about road signs has been developed and tested using a smart mobile phone. The study was carried out in Tanzania along an 80 km highway stretch from Arusha to Moshi town. The Haversine formula was used to measure and estimate the distance between two pairs of coordinates using the smartphone-based navigation application, Google Map. The application provides a voice alert to a needed action that enhances driver's attention. We propose an alternative method that identifies and modifies a specific class of energy inefficiencies. According to the experimental results, the proposed methodology has the benefits of high accuracy within a user radius of 10 meters, minimum bandwidth, and low-cost application. Furthermore, the system application was secured by limiting access to the application program interface key to avoid unauthorized access to sensitive information.

Author: Eric M. Masatu , Ramadhani Sinde , and Anael Sam

Year: 21 April 2022

A) Analysis of Sustainable Transport for Smart Cities

For decades, transportation has been considered as a link to all aspects of life worldwide. In this case, the world's natural environment, social well-being and economic development all usually depend on transportation systems. In most cases, safe, clean, sustainable and equitable transport systems help countries, especially in cities and urban centers, to thrive. However, a wide range of research shows that transportation systems in most of the cities and urban areas are unsustainable. In fact, some of these transportation systems are considered to be a threat to the environmental, social and economical aspects of future generations. In this perspective, therefore, changing such trends in transportation requires the collaboration of various stakeholders at regional, national and international levels. In this paper, therefore, a wide range of definitions of sustainable transport are discussed. More so, some of the aspects of smart transport for modern cities such as cycling and the role of women in sustainable transport were explored. With the aim of getting to the core of the subject, cases of women in bicycle transport, especially in the Netherlands and Germany compared to Kenya and Uganda are equally elucidated. Although not fully outlined,

the idea of smart cities and sustainable transport have heterogeneous characteristics globally as discussed herein.

AUTHOR: Dastan Bamwesigye and Petra Hlavackova

YEAR: 10 April 2019

B) An Overview on the Current Status and Future Perspectives of Smart Cars

In recent years, the smart car sector has been increasing enormously in the Internet of Things (IoT) market. Furthermore, the number of smart cars seems set to increase over the next few years. This goal will be achieved because the application of recent IoT technologies to the automotive sector opens up innovative opportunities for the mobility of the future, in which connected cars will be more and more prominent in smart cities. This paper aims to provide an overview of the current status and future perspectives of smart cars, taking into account technological, transport, and social features. An analysis concerning the approaches to making smart a generic car, the possible evolutions that could occur in the coming decades, the characteristics of 5G, ADAS (advanced driver assistance systems), and the power sources is carried out in this paper.

AUTHOR: Fabio Arena , Giovanni Pau , and Alessandro Severino

YEAR: 30 June 2020

C) LTE SCHEDULER ALGORITHMS FOR VANET TRAFFIC IN SMART CITY.

A new concept such as smart city was introduced in the last years where the Intelligent Transportation system (ITS) plays a critical role to provide road safety and manage Vehicular Ad Hoc Networks (VANETs) traffic. Nevertheless, VANETs have significant constraints like nodes high mobility, intermittent connectivity, variable network density and heterogeneity. However, the different types of traffic, the different Quality of Service requirements, the need to exchange mobile data, multi-services and data diversity leads mainly to load and time constraints in this specific and stringent type of networks. The main characteristic of this kind of networks is the very changing topology that poses supplementary constraints and makes achieving QoS constraints a very challenging task. In VANET network the vehicle generated traffic will be transferred to the data center from road side unit to the base station by using Long Term Evolution (LTE) in an urban area. Despite LTE has a larger system capacity and it provides a higher transmission speed, the network performance is affected by the implemented scheduling algorithm. In this context, we study the efficiency of LTE scheduler algorithms such as Proportional Fairness, Round Robin, Priority Set Scheduler, Maximum Throughput Scheduler and Throughput to Average Scheduler and Blind Equal Throughput mainly at the road side unit using Network Simulator 3(NS3) to determinate the most suitable scheduler for VANET traffic. Results demonstrate that the round robin algorithm is more effective for volumetric VANET traffic in terms of throughput, delay, packet loss rate and fairness.

AUTHOR: Khadija Raissi and Bechir Ben Gouissem

YEAR: 2020

D) COMPUTER VISION BASED TRAFFIC SIGN SENSING FOR SMART

TRANSPORT The paper puts forward a real time traffic sign sensing (detection and recognition) frame work for enhancing the vehicles capability in order to have a save driving, path planning. The proposed method utilizes the capsules neural network that outperforms the convolutional neural network by eluding the necessities for the manual effort. The capsules network provides a better resistance for the spatial variance and the high reliability in the sensing of the traffic sign compared to the convolutional network. The evaluation of the capsule network with the Indian traffic data set shows a 15% higher accuracy when compared with the CNN and the RNN.

AUTHOR: Mr. H. James Deva Koresh

YEAR: 2019

E) Exploring Smart Tires as a Tool to Assist Safe Driving and Monitor Tire–Road Friction

Road surface friction, or in other words, a pavement's skid resistance, is an essential attribute of highway safety, acting as a liaison between the infrastructure condition and the driver's response to it through proper vehicle maneuvering. The present study reviews aspects related to the tire–road friction, including affecting factors, monitoring systems and related practices, and demonstrates the efficacy of using smart tires, or tires embedded with sensors, for the purpose of evaluating roadway friction levels in real-time while traveling. Such an approach is expected to assist drivers in adjusting their behavior (i.e., lowering their speed) in the event that signs of reduced skid resistance are observed in favor of road safety. The current challenges and research prospects are highlighted in terms of tire manufacturers' perspectives as well as future mobility patterns with autonomous driving modes. Overall, smart tires are commented as a tool able to enhance drivers' safety for both current and future mobility patterns, help to control pavement deterioration and complement existing practices for infrastructure condition assessment.

AUTHOR: Maria Pomoni

YEAR: 26 July 2022