**LITERATURE SURVEY**

**TOPIC: SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY**

This project proposes a IOT based assistance for people. In present Systems the road signs and the speed limits are Static. But the road signs can be changed in some cases. We can consider some cases when there are some road diversions due to heavy traffic or due to accidents then we can change the road signs accordingly if they are digitalized. This project proposes a system which has digital sign boards on which the signs can be changed dynamically. If there is rainfall then the roads will be slippery and the speed limit would be decreased. There is a web app through which you can enter the data of the road diversions, accident prone areas and the information sign boards can be entered through web app. This data is retrieved and displayed on the sign boards accordingly.

Software used, Arduino IDE, Embedded C, hardware used NodeMcu ESP8266

**AN EFFICIENT AND SAFE ROAD CONDITIN MONITORING AUTHENTICATION SCHEME BASED ON FOG COMPUTING**

**AUTHORS:**  **MINGMING CUI, DEZHI HAN, JUN WANG**

In recent years, with the development of intelligent vehicles and wireless sensor network technology, the research on road safety has attracted much attention in vehicular ad-hoc networks (VANETs). By sensing events on the road, vehicles can broadcast information to inform others of traffic jams or accidents. However, the mobile vehicle network has a large transmission delay, which makes real-time content transmission impossible. In this paper, a new certificateless aggregate signcryption scheme (CLASC) is proposed by using a fog computing framework that supports mobility, low latency, and location awareness. It is combined with online/offline encryption (OOE) technology, which reduces many time-consuming operations and improves the security of vehicle users and the efficiency of message authentication. In addition, the scheme has the characteristics of mutual authentication, anonymity, untraceability, and nondeniability. Based on the difficulty of the discrete logarithm problem (DLP) and the computational Diffie-Hellman (CDH) problem, the scheme is further proved to be unforgeability and confidentiality under the random oracle model. The simulation results show that compared with the existing schemes, this scheme can not only ensure the security requirements of the system but also achieve higher efficiency in computing and communication.

**SMART TRAFFIC MANAGEMENT SYSTEM**

**AUTHORS: ABUBAKAR M. MIYIM, MANSUR A. MUHAMMED**

Millions of vehicles pass via roads and cities every day. Various economic, social and cultural factors affect growth of traffic congestion. The effect of traffic congestion has major impacts on accidents, loss of time, cost, delay of emergency, etc. Due to traffic congestions there is a loss in productivity from workers, people lose time, trade opportunities are lost, delivery gets delayed leading to increasing cost. In providing solutions to these congestion problems, a new robust and smart solution that is based on Vehicle-to-Infrastructure (V2I) technology capable of addressing road accident and traffic management in Nigeria's mega cities is proposed. In this paper, the proposed system serves as an alternative to the existing traffic management system with an intersection control station that communicates with vehicles approaching the intersection through the V2I network. The vehicles are equipped with Dashboard Traffic Light (DBTL) sensors that communicate with the infrastructure. A Safe-to-Pass-First (SPF) algorithm was designed that considered real time speed, vehicle position and data to decide when to allow the vehicle to pass through the intersection. The algorithm checks the status of conflicting lanes to ensure that vehicle pass the intersection safely. This method has been found to be more efficient than the existing methods as the average waiting time at the intersection is reduced by 23% and improved throughput recorded, Python code and SUMO were used for the simulation.

**AUTOMATIC ROAD TRAFFIC SIGNS DETECTION AND RECOGNITION USING ‘YOU ONLY LOOK ONCE’ VERSION 4 (YOLOv4)**

**AUTHORS: W.H.D. FERNANDO, S. SOTHEESWARAN**

This paper presents an approach to detect traffic signs using You Only Look Once version 4 (YOLOv4) model. The traffic sign detection and recognition system (TSDR) play an essential role in the intelligent transportation system (ITS). TSDR can be utilized for driver assistance and, eventually, driverless cars to reduce accidents. When driving an automobile, the driver's attention is usually drawn to the road. On the other hand, most traffic signs are situated on the side of the road, which may have contributed to the collision. TSDR allows drivers to view traffic sign information without having to divert their attention. Due to the existence of a large background, clutter, fluctuating degrees of illumination, varying sizes of traffic signs, and changing weather conditions, TSDR is an important but difficult process in intelligent transport systems. Many efforts have been made to find answers to the major issues that they face. The objective of this study addresses road traffic sign detection and recognition using a technique that initially detects the bounding box of a traffic sign. Then the detected traffic sign will be recognized for usage in a speeded-up process. Since safe driving necessitates real-time traffic sign detection, the YOLOv4 network was employed in this research. YOLOv4 was evaluated on our dataset, which consisted of manual annotations to identify 43 distinctive traffic signs classes. It was able to achieve an average recognition accuracy of 84.7%. Overall, the work adds by presenting a basic yet effective model for real-time detection and recognition of traffic signs.

**THE ROLE OF BLOCKCHAIN, AI AND IOT FOR SMART ROAD TRAFFIC MANAGEMENT SYSTEM**

**AUTHORS: ASHISH SHARMA, YOGESH AWASTHI, SUNIL KUMAR**

Nowadays vehicles are increasing on the road. Due to this, it is a challenge for society to manage traffic jams and road accidents all over the world. Artificial Intelligence (AI) such as Machine Learning (ML) algorithms are very helpful to improve the performance of the overall road safety management system. AI is used for many real-world applications to make any system be a smart system. The Smart Road Traffic Management System (SRTMS) easily recognizes the influence occurs for random changes on road safety. The SRTMS detects the unsafe driving patterns as well as convey the information to the respective authorities. The Internet of Things (IoT) is a boon technology to observe human activities in real-time. IoT devices or nodes are composed of sensors that are commonly utilized to identify and reply to electrical and other signals. Currently, Blockchain (BC) is the most trending technology to automate transactions, which means sharing or exchange of information between the IoT devices or nodes. BC technology facilitates for sharing of information on the network is decentralized, secure, persistent, anonymity, suitability and trustworthy manner. With consensus algorithms and smart contracts, Blockchain holds to manage communication among nodes without the involvement of a third-party or intermediary body. Simultaneously, AI has the ability to offer intelligent and decision-making machines similar to human beings' minds. This paper proposes the SRTMS model for solving the road accident, traffic jam and disseminate the information to all stakeholders. This proposed model is a combination of most trending technologies such as AI, BC, and IoT. This paper proposes the SRTMS model for solving the road accident, traffic jam and disseminate the information to all stakeholders. This proposed model is a combination of most trending technologies such as AI, BC, and IoT.

**COMMUNICATION SYSTEM FOR INTELLIGENT ROAD SIGNS NETWORK**

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The way of providing the end user with an accurate data regarding the current road conditions is one of the very important components in the area of Intelligent Transportation Systems (ITS). In such cases one of the possibilities is to display the adaptive content on a dedicated road sign. The most important issue in the process of building the trust between the road signalling infrastructure and the end user is the information significance and its value. The ongoing NCBiR project - InZnak - aims to introduce a new type of the road signalling subsystem which relies on intelligent road signs equipped with variety of sensors and adaptive led displays. Sensors feed the autonomous algorithms with data necessary to take decisions on how to react to current road conditions. The proposed system typically consists of a few road signs communicating with each other and exchanging measured data: weather conditions, road surface condition, traffic volume, avg. vehicles speed, detected road events, etc. On the basis of the information exchanged between road signs, each of them runs the autonomous algorithm to process that data and computes the current status of road section driving conditions. The InZnak project focuses on the problem of the traffic control using intelligent autonomous road signs. The process of the speed limit determination is often complicated and in many cases it is defined by numerous legal standards. In general, speed determination should take into account not only the technical aspect, but also social and legal aspects, which makes this process especially difficult. This paper presents the InZnak communication system architecture with the deployed prototype and its current status of integration.