# LITERATURE SURVEY ON SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY

Domain: Internet of Things

Team ID: PNT2022TMID29675

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## PAPER 1: NB-IoT based Road Accident Alert System

- **Publication Year:** 03 March 2022
- **Author:** Bharath G S, Meghana Bukkapatnam, Hitesh N, Shria Dhananjay Jadhav
- **Journal Name:** International Journal of Engineering Research & Technology
- **Summary:** Road safety is a major concern in any part of the world, the huge number of deaths caused by road mishaps can be reduced with the help of advanced IoT technology. Implementing the use of a collision detector module to detect an accident. To make sure that the collision is not a false alarm, a Micro-electromechanical systems accelerometer with an ultrasonic sensor is used to get confirmation of an accident at a particular place. Once the confirmation is received, the exact live location of the mishap is attained with the help of the GPRS module's longitude and latitude data coordinates. This information relay is compared with multiple communication protocols such as ZigBee, cellular, LoRaWAN, and NB-IoT, and this information is relayed efficiently with NB-IoT protocol and with pushing-box API to the emergency service station for immediate action. The system is also incorporated with a speaker to alert others nearby. By this damages can be mitigated, and many lives can be saved.

## PAPER 2: An IoT Based Car Accident Prevention and Detection System with Smart Brake Control

- **Published Year:** 22 January 2019
- **Author:** Mubashir Murshed, Md Sanaullah Chowdhury

- **Journal Name**: Procs. of International Conference on Applications and Techniques in Information Science
- **Summary:** Car accidents are considered one of the most destructive phenomena. As a solution, the advent of Internet of Things (IoT) technologies can reduce the number of accidents. Here, a smart system is described that alerts and controls the speed of a vehicle, also notifies the individuals accordingly when an accident occurs. This system always monitors the distance between vehicles and obstacles that are in front, using distance sensor. It will alert the driver to control the speed and reduce the speed by itself when a critical distance comes. Whenever an accident takes place for uncertain condition, an email alert will be sent to the accountable individual with car details.

## PAPER 3: Advanced Traffic Management System Using Internet of Things

- **Publication Year:** March 2016
- **Author:** Mahesh Lakshminarasimhan
- **Journal Name:** ResearchGate
- **Summary:** In the contemporary world, urban mobility is one of the unprecedented challenges to be tackled in the administration of a big city. Here an advanced traffic management system is proposed, implemented using Internet of Things (IoT). The system is supported by a circuit embedded in the vehicle, which operates using RFID with clustered systems. The functionalities of the system include efficient traffic light control, parking space identification and anti-theft security mechanism. The proposed architecture and working with big data analytics involving Hadoop is presented. Moreover, supervised learning methodologies are proposed that would help in determining the standard of roads, estimating overall traffic flow, calculating average speed of distinct vehicle types on a road and analyzing the travel path of a vehicle.

## PAPER 4: IoT-Based Smart Alert System for Drowsy Driver Detection

- **Publication Year:** 10 March 2021
- **Author:** Anil Kumar Biswal, Debabrata Singh, Binod Kumar Pattanayak
- **Journal Name:** Research Article
- **Summary:** In current years, drowsy driver detection is the most necessary procedure to prevent any road accidents, probably worldwide. . But drowsiness is a natural phenomenon in the human body that happens due to different factors. Hence, it is required to design a robust alert system to avoid the cause of the mishap. Here we address a drowsy driver alert system that has been developed using such a technique in which the Video Stream Processing (VSP) is analyzed by eye blink concept through an Eye Aspect Ratio (EAR) and Euclidean distance

of the eye. Face landmark algorithm is also used as a proper way to eye detection. When the driver's fatigue is detected, the IoT module issues a warning message along with impact of collision and location information, thereby alerting with the help of a voice speaking through the Raspberry Pi monitoring system.

## PAPER 5: An IoT Architecture for accessing Road Safety in Smart Cities

- **Publication Year:** 19 November 2018
- **Author:** Ahmed E.Kamal
- **Journal Name:** Research Gate
- **Summary:** The Safe System (SS) approach to road safety emphasizes safety-by-design through ensuring safe vehicles, road networks, and road users. With a strong motivation from the World Health Organization (WHO), this approach is increasingly adopted worldwide. Considerations in SS, however, are made for the medium-to-long term. Our interest in this work is to complement the approach with a short-to-medium term dynamic assessment of road safety. Toward this end, we introduce a novel, cost-effective Internet of Things (IoT) architecture that facilitates the realization of a robust and dynamic computational core in assessing the safety of a road network and its elements. In doing so, we introduce a new, meaningful, and scalable metric for assessing road safety.

## PAPER 6: Smart Vehicles Connectivity for Safety Applications

- **Publication Year:** 6-8 February 2014
- **Author:** Usha Devi Gandhi
- **Journal Name:** IEEE
- **Summary:** Connected vehicle technology aim to solve some of the biggest challenges in the transportation in the areas of safety, mobility and environment. In this project we focus on V2V communication, once cars are connected which is able to share data with other cars on the road and which help to reduce Highway accidents. Ultimately, vehicles are connect via multiple complementary technologies of vehicle to-vehicle (V2V) and vehicle-to-infrastructure (V2I) connectivity based on Wi-Fi, GPS, Dedicated Short Range Communication (DSRC). VANETS are also considered as one of the most important Simulator for safety of intelligent transportation systems. The use of the DSRC technologies support low latency vehicle-to-vehicle (V2V) communication.

## PAPER 7: Advances in smart roads for future smart cities

- **Publication Year:** 22 January 2020

- **Author:** Juan C.Cano and Francisco J.Martinex
- **Journal Name:** The Royal Society Publishing
- **Summary:** Smart Cities bring a new concept and model, which applies the new generation of information technologies, such as Internet of Things, cloud computing, big data, and space-geographical information integration, to facilitate the planning, construction, management, and smart services of cities.

## PAPER 8: IoT-Based Smart Street Light for Improved Road Safety

- **Publication Year:** January 2022
- **Author:** Md.Husibul Islam, Khadija Yeasmin Fariya, Md.Taslim Hossain Tanim
- **Journal Name:** ResearchGate
- **Summary:** The new age cannot be imagined without advanced technology. In many aspects of our lives, automated systems have taken over traditional systems. IoT plays a significant role in all automated devices. Road accidents have become a major concern today. In several occasions, persons have died because of not receiving emergency treatment services following an injury. This paper mentions a cost-effective IoT-based innovative system to track the accident from the authority's control room. The system can detect road accidents and notify the concerned authority by sending the location and car number. Deep learning has been used for implementation, the system can be operated by a mobile application from anywhere at any time, and the data will be updated periodically on the server.

## PAPER 9: An IoT based Intelligent Transport and Road Safety System

- **Publication Year:** 01 April 2022
- **Author:** P.Sharmila,J.M.Nandhini,K.Anuratha,SoshyaJoshi
- **Journal Name:** IEE
- **Summary:** To avoid and reduce 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 and 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.

## PAPER 10: IoT Based Driving Risk Assessment and Warning System

- **Publication Year:**01 December 2018
- **Author:** Alakananda Aithal, Sanjay Singh
- **Journal Name:** IEEE
- **Summary:** This IoT based project examines a solution which directs/assists the driver to maintain a specified safe distance between vehicles on roads to and avoid unsafe conditions leading to accidents. In the event of lack of attention on behalf of the driver or temporary distraction, the system is designed to alert him to the required focus on the road. The project will attempt to examine the possible risk factors both qualitatively and quantitatively in order to incorporate data based features into the system. The sensor data in the form of sensor graph can be served as the primary measure to take better decisions for secure and safe transportation. The system has the potential to improve the overall road safety, improve driver's standards by revising training, be used as a monitoring tool, analysis of accidents etc. using graphical representation, trend analysis etc., with the use of trend analysis the roads could be categorized as roads for safe transport or roads that are dangerous.it can also be used as a tool to identify dangerous roads.

## PAPER 11: IoT-driven road safety system

- **Publication Year:** 08 February 2018
- **Author:** D.Vishal,H.S.Afaque,H.Bhardawaj and T.K.Ramesh
- **Journal Name:** IEEE
- **Summary:** 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.

## PAPER 12: Smart Helmet

- **Publication Year:** April,2018
- **Author:** V.Vinod,K.Sai Krishna
- **Journal Name:** IJESRT
- **Summary:** The impact when a motorcyclist involves in a high-speed accident without wearing a helmet is very dangerous and cause fatality. A smart helmet is a special idea which makes motorcycle driving safer than before. This implemented using GSM and GPS technology. The working of this smart helmet is very simple, vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to microcontroller board.

So when the rider crashes and the helmet hit the ground, these sensors sense and gives to the microcontroller board, then controller extract GPS data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family members. It also has an alcohol detector sensor which detects whether the person is drunk and switches off the engine if the sensor output is high.