**CHAPTER 2**

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**RELATED WORK**

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**2.1 LITERATURE REVIEW <Times New Roman 12, All Caps>**

B.V.P. Prasad A et.al [2] presented different techniques used in Vehicle Over Speed Detection consists of a controller designed using Arduino Mega to monitor the location and speed of the vehicle obtained using a GPRS+GPS Quadband Module (SIM908), GSM antenna, GPS antenna and SIM card. If the vehicle presents in any of the defined regions, then the controller compares the speed of the vehicle with maximum allowable speed in that area. If over speeding is detected, a buzzer sound is generated from an active buzzer used in this system to alert the driver regarding exceeding the over speed.The data link layer J1939/21 describes the rules for constructing a message, accessing the bus, and detecting transmission errors. The application layer J1939/71and J1939/73 defines the specific data contained within each message sent across the network.

Cooperative Adaptive Cruise Control (CACC) [3], an automated application providing traffic throughput maximization and collision avoidance. A Neural Network based cut-in detection and trajectory prediction scheme is used. Also, a probabilistic framework in which the cut-in probability is calculated based on the output of the mentioned cut-in prediction block is designed. Finally, a specific Stochastic Model Predictive Controller (SMPC) which incorporates the cut-in probability to enhance its reaction against the detected dangerous cut-in menu over .

The STeC language model [4], which can effectively describe the system’s spatio-temporal consistency. The system resolves the problem of relieving the highway congestion in minimal time. The system describes a novel speed limit control based on Internet architecture. Finally, a control algorithm of the highway variable speed limit control system based on the formal model.

Forsman et.al [6] presented a microcontroller based speed limiting system which uses ARM7 processor and uses GSM for SMS Communication and LCD to display processed data and also a GPS module to trace the vehicle location. The different paths are divided into zones and differentiated by color where each color has a different speed limit and comes under different latitude ranges. The processor tracing the vehicle location and deriving the speed limit and consequently limits the speed .

Vehicle speed monitoring system presented in [7] contains pi camera, radar. The Doppler effect is used as a main principle here which is used in the radar. The system measures the objects which are moving with a frequency of 50 hertz are recorded to be over speeding. Then the camera clicks a snap and sends it to the nearest police station’s database and then the police can take necessary actions. To clarify the objects in the clicked snapshots, image processing is used .

A system presented in [8] uses RF modules to indicate restricted zones which are placed in front and back of these zones. And RF receiver is placed inside the vehicle itself. The speed of the vehicle is derived from the speedometer of the vehicle. Then a controller compares the current speed to the speed limit. The Driver receives an alert if the vehicle is too fast. If no response indicated the driver is imposed to pay the penalty amount at the nearest toll gate.

A low cost reliable IOT based framework [9] consisting of an array of RFID sensors which can track the vehicle in real time while in transit from on point to another point of high-speed limit expressways. In this system real time stamps are collected from the array of RFID sensor networks and the velocity of the vehicle is calculated using Euler’s algorithms in real time. An Arduino with ethernet connection is used as a core control system and the resultant data is stored in the cloud.

A system based on early detection and alert of dangerous vehicle driving patterns pointing towards rash driving. The system consists of an IR transmitter, IR receiver, control circuit and a buzzer. Speed limits are set by the Police Department who would use this system depending on the traffic. The time taken for one trip starting from one point to another is displayed on a 7-segment display and also, if the vehicle crosses the speed limit the buzzer starts making sound alerting the traffic police.

**2.2 EXISTING TECHNOLOGY <Times New Roman 12, All Caps>**

In [1], detection of vehicle over speeding and waning of driver is mentioned. They have used Radar plot, Analytic Hierarchy Process and Entropy Weight (AHP-Entropy). The challenges which they faced is that it detects only over speeding. Driver behavior is analyzed based on the data and data is viewed on mobile and uploaded on cloud. In future the over speed detection devices could be incorporated into every vehicle which will reduce the incidents of accidents on roads and various premises, with subsequent reduction in loss of life.

B.V.P. Prasad [2] have given an approach where they have used Big Data the driver’s driving behavior analysis is taken based on their speed and feedback is produced to improve their driving efficiency.[2] aims to assess the driving safety indicator through making scores on driver background and driving habits synthetically. The challenges which they faced are as they had huge sizes, diverse structures, rapid generating speeds, and extremely low value density, the data acquisition, cleaning, integration, analysis. In future the over speed detection devices could be incorporated into every vehicle which will reduce the incidents of accidents on roads and various premises, with subsequent reduction in loss of life.

In [3] the authors have proposed a "J1939 Bridge" based on the SAE J1939 communication standard only for HD vehicles. The data such as engine speed, rpm, coolant temperature, torque value, MAP is taken and driving behavior is analyzed. Driver behavior is analyzed based on the data and data is viewed on mobile and uploaded on cloud. Due to bad maintenance of heavy-duty vehicles sensors data are not retrieved properly. Further analysis on the fuel consumption or driving behavior for UBI (Usage Based Insurance) can be conducted

**2.3 INFERENCE OF LITERATURE REVIEW**

**Table 2.1 Inference of Literature Review**

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| --- | --- |
| **Title** | **Contribution** |
| **A Literature Review Paper on Different Techniques used in Vehicle Over Speed Detection [1]** | To design a device such that it will reduce the incidents of accidents on roads and various premises, with subsequent reduction in loss of life and properties. |
| **A System Design for Driving Behavior Analysis and Assessment [2]** | To assess the driving safety indicator through making scores on driver background and driving habits synthetically. System architecture is explained in detail for the analysis process and three algorithms. |
| **Design and Implementation of Data Collection and Driving Behavior Analysis Based on SAE J1939 [3]** | To assess the driving behavior through dashboard data and analyze the behavior and send human readable vehicular information to the mobile phone. |

**2.4 EXTRACTION FROM LITERATURE REVIEW**