LITERATURE REVIEW

Abd-Elhamid M. Taha et al [1] introduces a 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. We also showcase the use of machine learning in the design of the metric computation core through a novel application of Hidden Markov Models (HMMs). W. H. D. Fernando et al [2] worked on Automatic Road traffic signs detection and recognition using 'You Only Look Once' version 4 (YOLOv4) which 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.

García-Garrido et al [3] developed a traffic sign recognition system that uses a vision camera mounted on a vehicle. Based on the colours and shapes of the road signs, the system detected and recognized the signs. Wong Hwee Ling et al [4] performed a study that used a smartphone back camera to recognize traffic signs and alert drivers for an incoming sign. The phone was placed on a windscreen for the camera to face the road. The distinct advantage of the system was that it did not require additional hardware. Rajale et al [5] developed a road sign notification system based on the global positioning system (GPS) and wireless radio frequency identification (RFID) technology. A database of road signs and their locations was created. RFID transmitters were placed at the locations of road signs, and a receiver was placed in the vehicle. Using the system, drivers were alerted about the next road signs at some predetermined specific distance before the road signs were encountered.

A.Bhawiyuga et al [6] proposes the implementation of communication equipped road sign system which consists of two components: Road Side Unit (RSU) module deployed at road sign and On Board Unit (OBU) module deployed at each vehicle. In our proposed scheme, both of the devices communicate each other through the widely-used Wi-Fi protocol (IEEE 802.11n) operating in ad-hoc mode. While a OBU equipped vehicle is moving towards the communication range of RSU, it will make an association to a predefined wireless ad-hoc network. Once it is associated, the OBU can receive message broadcast by the RSU. Upon reception, OBU display alert message indicating that the vehicle is approaching a road sign. From performance testing we observe that the proposed system can give relatively good service the vehicle moving as fast as speed 90km/h with the distance as far as 90m.

W. Liang et al [7] conducts a study about VANETs which use vehicles as mobile nodes are a subclass of mobile ad hoc networks (MANETs) to provide communications among nearby vehicles and between vehicles and nearby roadside equipment but apparently differ from other networks by their own characteristics. Specifically, the nodes (vehicles) in VANETs are limited to road topology while moving, so if the road information is available, we are able to predict the future position of a vehicle; what is more, vehicles can afford significant computing, communication, and sensing capabilities as well as providing continuous transmission power themselves to support these functions

Yiqiang Wu et al [8] worked on Real-time traffic sign detection and classification towards real traffic scene. a real-time traffic sign recognition algorithm which is robust to the small-sized objects and can identify all traffic sign categories. Specifically, we present a two-level detection framework which consists of the region proposal module (RPM) which is responsible for locating the objects and the classification module (CM) which aims to classify the located objects. In addition, to solve the problem of insufficient samples, we present an effective data

augmentation method based on traffic sign logo to generate enough training data. Adnan Shaout et al [9] worked on An Intelligent Real Time Road Sign System. The behavior of US Interstate 94 was modelled, where the typical road throughput was simulated and published to an MQTT broker for the embedded system to display the expected travel time to Ann Arbor, Michigan from the US23 junction. The embedded system additionally sampled a digital temperature and humidity sensor to note road conditions, where an external input allowed operators to provide a real time update when an unexpected event causes traffic (i.e., vehicle collision) or when the road has been cleared.

Srinivas Bachu et al [10] develops a system which works by signaling or warning through WI-FI, to avoid the accident in nearby areas. If the Bridge zone is narrower than 100 meters from vehicles, a mobile warning will be issued via the WI-FI network. The person reduces the vehicle speed following this indication. Just like if a school area closer to vehicles is within 100 meters, the cell phone will be alerted via WI-FI. The person reduces the speed of the vehicle after this indication. Like Fog, it gives message warning to mobile devices via the WI-FI area within 100 meters. The individual decreases the speed of the vehicle following this indication. This sign helps us to reduce road injuries.

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