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Road Accident Prediction and Alert System: A Review

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ABSTRACT: Every day around the world, a large percentage of people die from traffic accident injuries. An effective approach for reducing traffic fatalities is: first building automatic traffic accident detection system, second, reducing the time between when an accident occurs and when first emergency responders are dispatched to the scene of the accident. Recent approaches are using built-in vehicle automatic accident detection and notification system. While these approaches work fine but they are expensive, maintenance complex task, and are not available in all cars. On the other hand, the ability to detect traffic accidents using smart phones has only recently become possible because of the advances in the processing power and sensors deployed on smart phones. Most of the Smartphone based accident detection systems rely on the high speed of the vehicle to detect an accident. We proposed the system which consists of two phases; the detection phase which is used to detect accident. The notification phase which is used to send information.

KEYWORDS: Accident Prediction, Machine Learning, Traffic, Notification, Prediction, Alert System

I. INTRODUCTION

Traffic accidents are a major public issue worldwide. Road collisions are the second leading cause of death. The main reason for the death of a person during an accident is the lack of availability of the resources.Thus, in the case of incidents involving vehicular accidents, response time is crucial for the timely delivery of emergency medical services to accident victims and is expected to have an impact on fatalities. Moreover, each minute is passed while an injured crash victims do not receive emergency medical care can make a large difference in their survival rate, for example, Analysis shows that if we decrease just 1-minute in accident response time that can increase chances of saving an individual's life up to six percent.

The purpose of this proposed system is to design and implement such an automated system that uses smartphone to detect vehicle accidents and report it to the nearest available responders to help counter these emerging problems and reduce casualties as much as possible. The detection system would help reduce fatalities due to vehicle accidents by decreasing the response time of emergency services.

In this work we are utilizing android smartphone to detect accidents and report it to the nearest available emergency responders i.e. Hospital and Police Station with the exact location of victims in emergency. On an emergency responder side, they will accept the location and medical data from the incident that occur near to them and rescue them as soon as possible. Accident detection and rescue operation is time critical operation. Real time action is required. System should be able to detect and react to the situations in real time. Real time response should be considered while designing the architecture. Traffic density now a day is huge. Accident detection and rescue system is essential for every vehicle.

II. RELATED WORK

Literature survey is the most important step in any kind of research. Before start developing we need to study the previous papers of our domain which we are working and on the basis of study we can predict or generate the drawback and start working with the reference of previous papers.

In this section, we briefly review the related work on accident detection system and their different techniques.

In the article [1], they implemented a device of this type that not only detects any accidents that occur in the car, but immediately informs the corresponding authorities as soon as the accident occurs. We have connected 8 digital sensors to μc positioned in various positions of the vehicle. As soon as an incident is detected, a μc pulse is applied. The μc then activates a buzzer and sends an emergency SMS (using the AT commands) to the interested persons [1].

In the article [2], Automatic detection of Intelligent Accidents (ASAD) is a self-detection unit system that immediately notifies you Emergency contact via a text message when a moment changes in acceleration, rotation and impact force at one end of the vehicle is detected by the system, specifying the position and the moment of the accident. The idea is that as soon as an accident is detected by the system, authorities should be immediately notified to avoid further car congestion and to allow passengers who will be escorted to the hospital in a timely manner. The system involves the use of fuzzy logic as a decision support integrated into the smartphone application that analyses the data coming from the sensors and makes a decision based on a set of rules. The simulated results show an accuracy of 98.67% of the system with failures resulting from the "gray regions" of the variable values.

In the article [3], presents HDyCopilot, an Android application for integrated incident detection with multimodal alarm dissemination, both through eCall and IEEE 802.11p. The proposed the incident detection algorithm receives the vehicle entries, through ODB-II and smart phone sensors, or the Accelerometer, magnetometer and gyroscope. The Android the smartphone is also used as a human-machine interface, therefore the driver can configure the application, receive the danger on the road warnings issued by other vehicles nearby and cancel Countdown procedures for detecting false incidents. A prototype the implementation was validated through laboratory tests

In the article [4], the results prove it Algorithm improves the estimate of the risk of an accident compared to the estimated risk based only on the historical records of accidents. It was found that the algorithm is more efficient, especially in the case of analysis of fatal and pedestrian accidents. Impact on industry: the result of the proposal the algorithm can help authorities effectively identify areas with a high risk of accidents. Furthermore, you can to serve as a reference for urban planners who consider road safety.

In the article [5], they present a new method for automatic traffic incident detection, based on the hydrodynamics of the softened particles (SPH). In our method, we obtain a movement flow field of video through the dense optical flow extraction. So a thermal diffusion process (TDP) is exploited to activate the movement flow field in a coherent motion field. Approximation particles moving towards individuals, their forces of interaction, represented as endothermic reactions, are calculated using the measurement of enthalpy, thus obtaining potential particles of interest. Furthermore, we use SPH that accumulates contribution of each particle in a weighted form based on a function of the kernel Experimental evaluation is performed in a series of video sequences compiled by YouTube and the results obtained are compared with a state of the art technique.

III. EXISTING SYSTEM

Lot of work has been done in this field because of its extensive usage and applications. In this section, some of the approaches which have been implemented to achieve the same purpose are mentioned. These works are majorly differentiated by the algorithm for detection systems.

As my point of view when I studied the papers the issues are related to accident detection systems. The challenge is to addressing interoperatibilty and highest detection accuracy from positive examples is based on the detection of co-clusters between users and items with similar patterns.

IV. CONCLUSION

The System design methodology is proposed automatic system for detecting and Notify Accidents. Volume, speed, Big Data Aspects of Variety and Veracity are taken into consideration when designing architecture. An architecture and design methodology is proposed for intelligent accident detection and notification System for Emergency Assistance. Cost effective smartphone based accident detection system reduce the time between when an accident occurs and when first emergency responders are dispatched to the scene of the accident which help a lot in accident situations to save human life. Every smartphone based accident detection and notification system is exposed to false positives. In the proposed system, helpful supporting features were added to the system to increase the accuracy of detection process and reduce the probability of false positives. Proposed system presents a confirmation screen which gives the user the opportunity to confirm the accident, thus in case of false positive occurs the user can cancel the alarm and notification is aborted. It allows for uninjured peoples or bystanders to take image, location and send them to emergency responders, for reporting the accident.

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