

## Intelligent Accident Detection and Notification System for Emergency Assistance

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**ABSTRACT** - Every day in the world, a most of the people die from traffic accidents. An effective approach to reduce road accident deaths is first to build the automatic road accident detection system, second, to reduce the time between when an accident occurs and when the first emergency person is sent to the scene of the accident. Recent approaches use the integrated system of automatic accident detection and accident notification. While these approaches work well, but they are expensive, they require complex maintenance tasks and are not available in all cars. On the other side, the ability to detect traffic accidents with android phones was only possible thanks to advances in processing capacity and sensors implemented in android phones. Most android-based accident detection systems depend on the vehicle's high speed (fetched from the GPS) and the G-Force value (fetched from the accelerometer sensor) to detect an accident. We proposed the system which consists of two phases; the detection phase which is used to detect car accident using android phone. The notification phase which is used to send information such as images, latitude and longitude to the emergency responder for fast recovery using android and Hadoop Framework.

**Keywords-** Big data system, GPS, Traffic accidents; accident detection; android phones; real-time tracking; emergency services

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### I. INTRODUCTION

Traffic accidents are a major public issue worldwide. Street crashes are the second driving reason for 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 identification framework would help diminish fatalities because of vehicle mishaps by diminishing the reaction time of crisis administrations.

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.

#### A. Motivation

The huge number of injuries and death as a result of road accident uncovers the story of global crisis of road safety. The most obvious reason for a person's death during accidents is unavailability of the first aid provision, which is due to the delay in the information of the accident being reached to the ambulance or to the hospital. Our proposed system "Intelligent Accident Detection And Notification System For Emergency Assistance" helps to overcome this problem which consist of two phases detection phase to detect the accident and notification phase to inform the emergency centre

i.e. nearest hospital or police station to get help within a less amount of time.

## 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  $\mu\text{c}$  positioned in various positions of the vehicle. As soon as an incident is detected, a  $\mu\text{c}$  pulse is applied. The  $\mu\text{c}$  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 HDy Copilot, 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 smartphone 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 APPROACH

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 interoperability from positive examples is based on the detection of co-clusters between users and items with similar patterns.

## IV. PROPOSED APPROACH

This area sensibly outlines the component of the proposed framework structure together with every module that builds the general framework. The proposed system, called "Intelligent Accident Detection And Notification System For Emergency Assistance", consists of two phases; the detection phase, is used to identify the occurrence of an accident and notification phase, is used to inform nearest Hospital and Police station for emergency help. Each android phone based accident detection and notification system is exposed to false positives. In the proposed framework, accommodating supporting highlights were added to the framework to increase the accuracy of detection process and decrease the probability of false positives. "Intelligent Accident Detection and Notification

System for Emergency Assistance “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. If he is not able to cancel then the accident is detected. The proposed system allows for uninjured peoples to take image, location and send them to emergency responders, for reporting the accident.

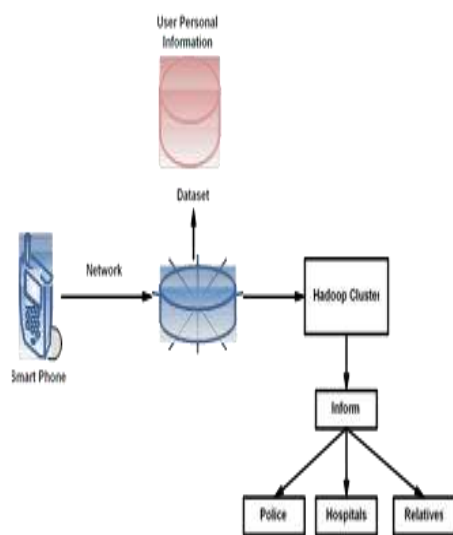


Fig. System Architecture

## V. 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. 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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