International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

AN AUTOMATIC VEHICLE ACCIDENT DETECTION SYSTEM

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ABSTRACT

A novel approach for automatic road accident detection is proposed. The approach is based on detecting damaged vehicles from footage received from surveillance cameras installed in roads and highways which would indicate the occurrence of a road accident. Detection of damaged cars falls under the category of object detection in the field of machine vision and has not been achieved so far. In this research, a new supervised learning method comprising of three different stages which are combined into a single framework in a serial manner which successfully detects damaged cars from static images is proposed. The three stages use five support vector machines trained with Histogram of gradients (HOG) and Gray level co-occurrence matrix (GLCM) features. Since damaged car detection has not been attempted, two datasets of damaged cars - Damaged Cars Dataset-1 (DCD-1) and Damaged CarsDataset-2 (DCD-2) – was compiled for public release. Experiments were conducted on DCD-1 and DCD-2 which differ based on the distance at which the image is captured and the quality of the images.

1.0 INTRODUCTION

Every year in India around 1214 road accidents occur and about 377 casualties happen every day. Maximum of the accidents result in deaths as ambulance is not called immediately and as people do not inform the ambulance to avoid police interrogation. The accident might occur at an isolated location where people are not present to report the accident. Recent technologies in vehicles have inbuilt hardware modules to spot and report accidents. Such systems are expensive and non-portable. Not all cars have such systems, only luxury cars have such facility. Hence we introduce our model which will identify the accident with the help of sensors in the Smartphone. Since many Smartphone have the basic required sensors and good computing power, they could be employed to detect accidents and request response. As compared to hardware add- ons, Smartphone are portable - we could carry them in any vehicle we are driving or even travelling in. The way we would use their sensors will make this system inexpensive and lifesaving. The processes to detect accidents could be updated easily and has more scope for forthcoming enhancements. As we are using Smartphone for communication we could use multiple ways of communicating with server, i.e. if the internet connectivity is not available the SMS could be used to converse with the server for help. The principal objective of is to successfully detect accidents and communicate the same to ensure that the medical assistance can reach the accident location on time. The data from this system could be used to analyses and study the acceleration waveforms generated during the accidents.

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2.0 LITERATURE SERVEY

Automatic Accident Detection and Ambulance Rescue with Intelligent Traffic Light System.

It is a full hardware based system including the likes of microcontroller, modem, drivers, GPS etc. It includes three basic units – Vehicle unit, Ambulance control unit, and Traffic unit. The author has developed a hardware system which in case of an accident notifies ambulance with appropriate data about the accident location. And ITLS system will help the ambulance to reach the hospital at earliest by manipulating the traffic signals. This can be efficiently carried out with the help of Smartphone with their in-built sensor and Google maps. Besides that, the GSM modem used in the system creates a delay while sending messages to the ambulance control unit (since it is a queue based technique) also the maintenance or upgrading process of this ITLS system is quite expensive.

Utilizing the Emergence of Android Smartphone for Public Welfare by providing Advance Accident Detection and Remedy by 108 Ambulance

Here they have developed an android application that is used to identify the accident using variation in acceleration parameters. After detecting the accident application spontaneously generates the topographical information by GPS and send pre-recorded voice message to emergency response service. The crucial theory behind the working of this application is that the mobile phone should not be kept with the driver who is driving the car. It must be attached inside the vehicle. The biggest shortcoming or the loophole in this system is that the phone may tilt or fall inside the vehicle accidently without having a real time accident thus eneratingfalse positives.

Providing Accident Detection in Vehicular Network through OBD-II Devices and Android based Smartphones

Here the researcher develops an accident detection and report system that chain Smartphone with vehicle through a second generation On-Board-Diagnostics (OBD-II) that works as an interface to accomplish smart vehicle modeling, providing the user emergency facilities. The researchers have established an android application that deploys an SMS to pre-stored address with related information about the accident location. Also a call is made to the emergency service. The only prerequisite to reach the goal of this system is OBD-II standard. The OBD- II standard is made compulsory from 2001 in U.S and it is also a European, and Japanese variantof this standard, thus this solution is limited to these countries only. Besides that the maintenance as well as upgrading procedure of the system is pretty expensive.

Accident Detection Depending on the Vehicle Position and Vehicle Theft Tracking, Reporting Systems

Here the researcher introduces a new system with different algorithm that sense the accidents with the help of accelerometer sensor's tilt direction and other various hardware like GSM

modem and GPS. The researches have also developed an android application which will display the accident location in case it happens. The vital components on which the system is solely dependent are the 3-axis accelerometer sensor and GSM modem, which can be replaced with a single device i.e. 'Smartphone' as it comes with the entire mentioned sensor above pre-built init. In addition to this system uses GSM modem, which can create a delay while sending the emergency message to the user as it is a queue-based technique. Besides that the maintenance of the hardware system is quite expensive.

Car Accident Notification System based on Internet of Things

Here the researchers introduce an emergency call notification system using Internet of Things and Cloud computing. The researches have implemented the proposed system using XBee Wi-Fi module, XBee Shield, GPS module, Seeding and crash sensors. The basic idea is to detect the accident with the help of crash sensor and trace the exact coordinates of the accident spot via cloud using XBee Wi-Fi to the nearest hospital. The main aim was to propose a system allowing global interconnect with the Internet of Thing and Cloud. Despite the limitation the system is a step forward in the field of Internet of Things and with the help of Cloud the information can be transmitted to a long distance. Furthermore the system can be improvised by programming the system to immediately notify the family members of the victim.

Assistance through Communication Technologies and Vehicle

Proposed a prototype architecture called as e-NOTIFY which will help in increasing the chanceof survival for passengers involved in car accidents. The proposed system offers automated detection, reports and assistance to the victims exploiting the capabilities of vehicular communication technologies. The goal of the system is to provide an architecture that allows

1. Automatic sending of data files containing information about the incident to the control unit.

2. Assessment of the damage done to the vehicle and its occupants, based on the data received from the incident. According to the reported information and the preliminary accident estimation, the system will alert the required rescue organization to optimize accident assistance.

3.0 Existing System

Accident detection and alert systems are already in place, however, they are mostly implementedin limited scenarios such as in vehicles, highways or specific locations**.**

DISADVANTAGES OF EXISTING SYSTEM:

1. Most existing accident detection systems are designed for specific scenarios or locations, such as in-vehicle systems or highway systems. This means that accidents that occur outside of these scenarios may not be detected.
2. Some existing systems, such as smartphone-based accident detection apps, may raise privacy concerns as they may require access to personal data and location information.
3. Even when an accident is detected, existing systems may have a delay in alerting

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emergency services due to technical issues, network connectivity issues, or human error.

4.0 PROPOSED SYSTEM

A proposed system for accident detection and alert would be an integrated platform that can different scenarios and alert emergency services in real-time. This system could use AI-powered algorithms to detect accidents.

ADVANTAGES OF PROPOSED SYSTEM:

1. It can help to save people life from road Accident.

2. If any accident occur it will automatically detect the accident and it will send google mapLocation to nearby hospital.
3. Hospital will accept the request and send the Ambulance to that Location.

4. The Ambulance driver can open the google map link recieved in email ann reach to thelocation.

5.0 OUTPUT SCREENS

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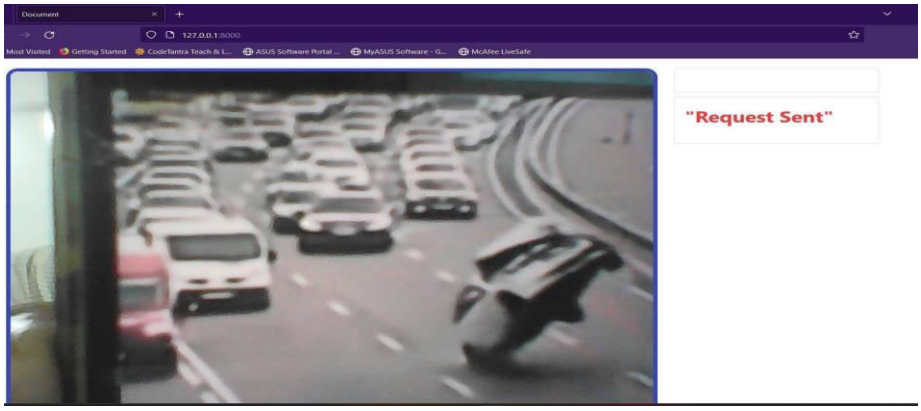

6.0 CONCLUSION

The accident detection and alert system provide emergency responders with crucial information atthe earliest possible time. Reducing the time between when an accident takes place and when it is detected can reduce mortality rates. Thus this work will reduce the accident death ratio in considerable amount even in rural and urban roads.

This proposed work will provide vital information about the accidents even in unpopulated area. So, the pre-configured contacts could be able to serve to the victims with better efficiency and theycould plan to have important first aid kits which have to be brought along with them to the accident spot. Thus this work ensures the reduction of death ratio and fatalities in the country like India andalso which will have a greater importance in day to day life.

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