

## Distracted Driving And Driver Abnormal Behaviour Detection While Driving

**Nangare Neha, Sagade Kavita, Tikal Shubham, Gawali Navita and Chitalkar Sandeep**

*Department of Computer Engineering  
Sinhgad Institute Of Technology And Science, Narhe, Pune  
nangareneha@gmail.com  
kavitasagade24@gmail.com  
shubhamtikal@gmail.com  
navitagawali2014@gmail.com  
smchitalkar\_sits@sinhgad.edu*

### **Abstract**

*Safe car driving has become a priority in everyday life. The main reason for designing a real time system which monitors the state of the driver to a decrease the car accident that will benefit millions of people around the world. Monitoring the road condition has acquired a critical significance during recent years. To detect the driver's drowsiness, rash driving, accident detection, usage of mobile phones and road condition on google map. With the help of the front camera of smart phone, decreasing the possibility of accident by analysing the movements of the driver and the vehicle. This method is able to detect texting while driving(TD) patterns automatically without using any extra devices. While it informs to the driver's relatives, nearby police station, hospital by sending them a short message service in case of an accident is worked on. System predicts the quality of the road based on tri-axial accelerometer and gyroscope while show the road condition and display on a map using global positioning system(GPS).*

*Keywords— Blinking, driving, drowsiness, texting-while-driving, gyroscope and accelerometer sensor, GPS, path hole.*

### **I. INTRODUCTION**

According to the number of traffic accidents are rising due to drowsy driver, rash driver, road conditions and mobile usage have come to the fore as a factor which threats life safety. When the reasons for traffic accidents are investigated, there is a major number of accidents total in the world, Safe car driving has become a priority in everyday life. The main reason for designing a real-time system that monitors the state of the driver's abnormal behaviour is related to a decrease in accidents that will benefit millions of people around the world. According to the world health organisation (WHO), most of the accident occurs because of traffic accidents. In this method accelerometer sensor, gyroscope sensor and GPS are used to find out the behaviour of the driver.

This work proposes a method to detect and to monitor the abnormal behaviour of the driver and road conditions. With the help of the camera, decreasing the possibility of an accident by analysing the state of sleep from the movements of the driver when the driver becomes drowsy, their blinking patterns changes and accordingly the system detects drowsiness of the driver. When a user is using a mobile phone. While driving, the smartphone embedded sensors (i.e. gyroscope, accelerometer and GPS) collect the associated information and analysed to see whether there exist some specific TD patterns or not. Without using any extra device it sends an alert message to the user and caller. There are different type of abnormal driving behaviours (Fast U-turn, fast right-turn, fast left-turn, zigzag patterns, etc.). The working of the accelerometer sensor and orientation sensor is on X-axis and Y-

axis. (accx,accy,orix,oriy). This method works online as well as offline and can monitor the fine-grained abnormal driving behaviours while driving and send the alert message to the user.

As several accidents are increasing day by day this system detects an accident and send an alert message to the user, nearest hospital, police station and the user's relatives. The user takes action on the alert message the system provides service to the user Distracted Driving and Driver Abnormal Behaviours Detection While Driving 2 accordingly. Road condition data changes over time since it also usually requires considerably significant investment and time to collect the data regularly. Road surface roughness is regarded as one of the most important road conditions because it affects vehicle maintenance costs, fuel consumption, comfort and safety. The system uses the smartphone sensors to assess and monitor road conditions and detect path holes /bumps/anomalies and their locations, and analyses the different road defects and shown the record on the google map.

#### A. MOTIVATION

To develop an application based on user safety as well as public safety to reduce the number of accidents-related problems. While driving, mobile phone usage is dangerous that it may cause a traffic accident and even if the user gets a call then the call is detected and automatically ended and sends a text message to the user.

#### B. Problem Statement

To detect human abnormal behavior, road condition, and smart phone usage while driving using sensors and send response alert.

#### C. Objectives

- To detect the driver's abnormal driving.
- To detect drowsiness.
- To detect the road conditions and report to the admin.
- To send the alert message to the user.

### II. LITERATURE SURVEY

#### A. Literature Survey

Oana Ursulescu et.al [1] proposed “Driver Drowsiness Detection Based on Eye Analysis” in which the system detects the movements of the vehicle. The accuracy of the paper is that the face detection is done with eye detection and faster detection is done along with it also sends the alert message to the user. The drawback of the paper is that detection is done on the blinking of eyelashes and it does not detect the eye's current position whether the eyes are open or close.

The “Drive Now, Text Later: Nonintrusive Texting-While-Driving Detection using Smartphones” approach was used by Xuefeng Liu et.al [2] in which some build-in sensors collect the associated information and analyze whether the T D patterns exists or not. The benefits of the paper are that it avoids accidents and the correlating touch strokes detect the speed and are shown with the help of

wavelet transform. The pitfall of the paper is that it mostly focuses on the drive mode which blocks all the messages and calls from the user and it does not send alert messages automatically.

Zhongyang Chen et.al [3] suggested “Abnormal Driving Behaviors Detection And Identification using Smart Phone Detection” which tells about the movements of the vehicles that the driver is taking the fast U-turn, left-turn, right-turn, zig-zag, etc. the advantage of the paper is which improves drivers awareness of driving habit and is also used for the safety of the driver Distracted Driving And Driver Abnormal Behavior Detection while Driving and decrease in the number of accidents. The limitation of the paper is a large number of test tubes and operational sensors are used.

“Smart Application for Drowsiness Detection during Driving” is propounded by Baris Guksa et.al [4] which analyze the state of sleep from movements of driver and detection of the speed of the vehicle in which the utility of the paper says about the speed detection of the driver is done on the face.

Azza Allouch et.al [5] come up with “RoadSense: Smartphone Application to Estimate Road Conditions using Accelerometer and Gyroscope” which monitors the road conditions based on the accelerometer and gyroscope sensors and the effectiveness of the paper is where road conditions are detected according to the vehicle movements and sensor readings and the number of accidents are also avoided. The disability of the paper is the user needs to capture the image on its own it does not capture automatically.

“Discovering the Uses of Smartphone Accelerometer and Gyroscope sensors to Study on the Estimation of Street Surface Unevenness Condition” was proposed by Viengnam Douangphachanh et.al [6] in these paper sensors detects the roads roughness condition and maintains the data. The obstruction of the paper is number of devices and numbers of sensors are placed at different locations in the vehicle.

Kalyan Sasidhar et.al [7] suggested “Two Wheeler Rash Drive Detection using Smartphones” which says that a portable method using build in accelerometer of the smartphones to detect and identify abnormal driving behaviors such as weaving, lane changing and sudden braking. The drawback of the paper is it does not consider different road types.

“Smart Vehicle Accident Detection and Alarming System using a Smartphone” was planned by Adman Bin Faiz et.al [8] in this paper the application is integrated with external sensors to extract the outward force of the vehicle body. It measures speed and change of tilt angle through GPS and accelerometer sensors respectively on Android mobile phone. By testing conditions, this application is also capable of reducing the rate of wrong alarm. The restriction of the paper is it is much costly.

Arkham Zahri Rakhmani et.al [9] recommended “Fall Detection System Using accelerometer and Gyroscope Based on Smartphone” in this accelerometer and gyroscope sensors are embedded in smartphones to get the result of fall detections more accurately. Automatic call as an alert will be sent to the family members if someone using this application in fatal condition and needs some help. The limitation of the paper is that it detects the persons fall while walking.

Table I shows Literature Review of the multiple papers referred.

TABLE I  
LITERATURE REVIEW

Sr, No.	Paper Title	Paper Theme/Idea	Pros / Cons
1.	Driver Drowsiness Detection Based on Eye Analysis (2018)	In this paper, they propose a system in which they detect human drowsiness based on eye color.	<ol style="list-style-type: none"> <li>1. The face detection is done with eye detection</li> <li>2. Faster detection is done</li> <li>3. Send alert message</li> </ol>
2.	Drive Now Text Later (2016)	In this paper some build in sensors collect the associated information and analyse.	<ol style="list-style-type: none"> <li>1. Avoidance of accident</li> <li>2. Correlating Touch Strokes</li> </ol>
3.	Abnormal Driving Behaviors Detection And Identification Using Smart Phone Detection (2015)	They proposed a system which detects the movements of vehicle.	<ol style="list-style-type: none"> <li>1. Improves drivers awareness of driving habit</li> </ol>
4.	Smart Application for Drowsiness Detection during Driving (2017)	It analyse the state of sleep from movements of driver and detection of speed of vehicle.	<ol style="list-style-type: none"> <li>1. Speed detection</li> <li>2. Vehicle movements</li> </ol>
5.	Road Sense: Smartphone application to Estimate Road Conditions using Accelerometer and Gyroscope (2017)	In this paper it detects the path holes and smooth road and shows on google map.	<ol style="list-style-type: none"> <li>1. Choose better route</li> <li>2. Route shown on map</li> </ol>
6.	Exploring the Use of Smartphone Accelerometer and Gyroscope to Study on the Estimation of Road Surface Roughness Condition	In this paper sensors detects the road roughness condition and maintains the data	<ol style="list-style-type: none"> <li>1. Cost effective</li> <li>2. Easy to implement</li> </ol>
7.	Two wheeler rash drive detection using smartphones	In this paper, they propose a portable method using just the built-in accelerometer of a smartphone to detect and identify abnormal driving behaviours such as weaving, lane changing, and sudden braking.	<ol style="list-style-type: none"> <li>1. Identify the specific abnormal driving pattern</li> <li>2. Avoid accident</li> </ol>
8.	Smart Vehicle Accident Detection and Alarming	This application is integrated with an external sensor to	<ol style="list-style-type: none"> <li>1. Sends alert by alarm</li> <li>2. Detects accident</li> </ol>

	System Using a Smartphone	extract the outward force of the vehicle body. It measures speed and change of tilt angle with GPS and accelerometer sensors respectively on Android phone. By checking conditions, this application also capable of reducing the rate of false alarm.	situation.
9.	Fall Detection System Using Accelerometer and Gyroscope Based on Smartphone	In this paper accelerometer and gyroscope sensors are embedded in smartphone to get the result of fall detection more accurately. Automatic call as an alert will be sent to family members if someone using this application in fatal condition and need some help.	1. Automatic call sends an alert

### III.EXISTING SYSTEM

In existing system we face the problem as every detection system has its own separate system as if there are 2-3 detection system then the user needs to carry 2-3 systems which is not effective and easier for user. In system once activated, blindly block all the messages can't get the notification if driver gets call. If rash driving /drivers abnormal behavior happens does not send alert message. It only provides the status of road not any other information like traffic update.

### IV. PROPOSED SYSTEM

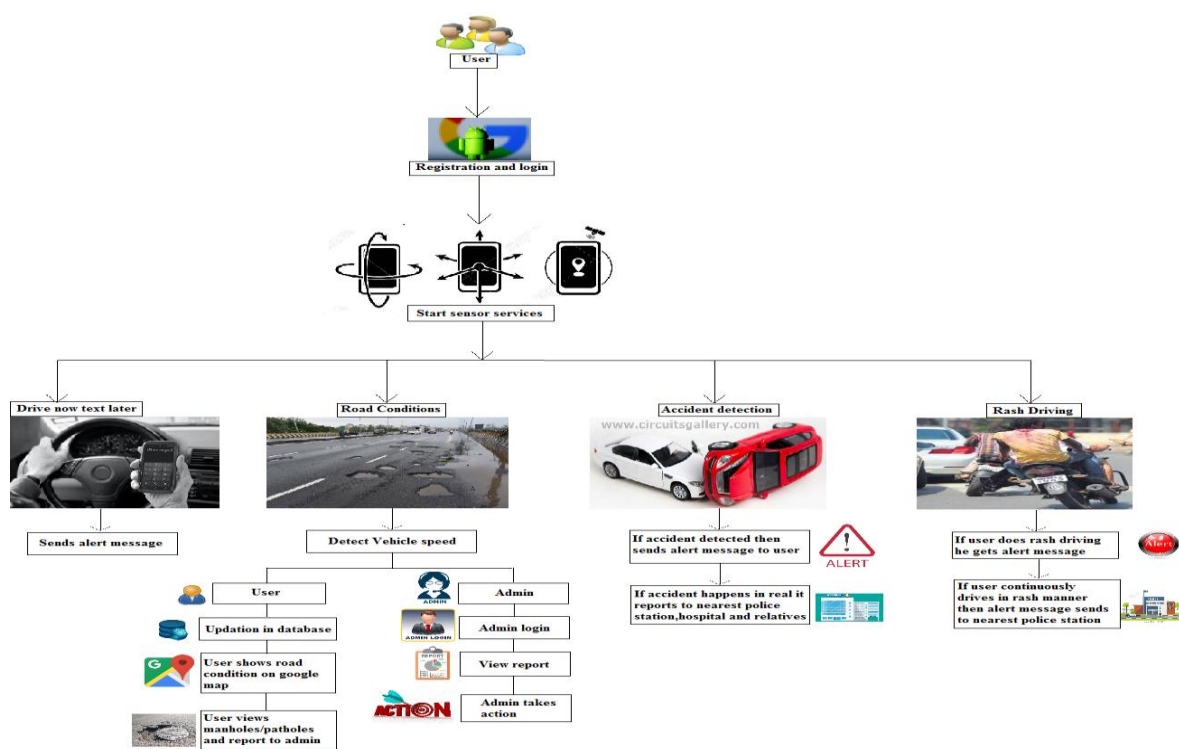


Fig.No.1 System Architecture 1

Fig.No.1 shows that user register or login for application. After login, the service of sensors is gets started which provides the alert message. When 1.user performs rash driving, 2.if accidents happen, 3.user gets an incoming call. The alert message provided to the user, relative, police stations, and hospitals. Show road condition to other user.

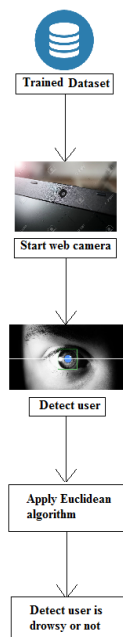


Fig.No.2 System Architecture 2

Fig.No. 2 demonstrates that data is getting trained. After getting trained data from dataset application starts web camera for user detection while detection is over the detected data is getting compared with the trained dataset by using "Euclidean algorithm" which shows the user is drowsy or not.

## V.CONCLUSION AND FUTURE SCOPE

In this paper distracted driving and driver's abnormal behavior detection while driving system prototype for smartphone was proposed sensor data was sample from a smartphone user. Our proposed approach is capable for deciding whether the driver's abnormal behavior is detected or not and immediately traces nearest police station, hospital as well as relatives and sends emergency alert message for help. Besides we have demonstrated the system for decreasing the number of accidents, road condition and drivers abnormal behaviors. Though the system requires continuous internet connection and can be applied significantly in practical world. In future we have planned to consider more parameters for detecting accidents and drivers abnormal behavior conditions. Hence the application will play a crucial role in post accident services and could mitigate the effect due to accident remarkably.

## REFERENCES

- [1] Oana Ursulescu et al, "Driver Drowsiness Detection Based on Eye Analysis" International conference publication on (2018).
- [2] Xuefeng Liu and Jiannong Cao "Drive Now Text Later" International conference publication on (2016).
- [3] Zhongyang Chen, et al, "Abnormal Driving Behaviours Detection And Identification Using Smart Phone Detection" (2015).
- [4] Baris Guksa and Burcu Erkmen, "Smart Application for Drowsiness Detection during Driving"(2017).
- [5] Azza Allouch, et al, "RoadSense: Smartphone application to Estimate Road Conditions using Accelerometer and Gyroscope"(2017).
- [6] Viengnam Douangphachanh and Hiroyuki Oneyama," Exploring the Use of Smartphone Accelerometer and Gyroscope to Study on the Estimation of Road Surface Roughness Condition"(2014).
- [7] Kalyan Sasidhar and Aswini Upasini , "Two wheeler rash drive detection using smartphones"(2019).
- [8] Adnan Bin Faiz ,et al,"Smart Vehicle Accident Detection and Alarming System Using a Smartphone"(2015).
- [9] Arkham Zahri Rakhmani, et al," Fall Detection System Using Accelerometer and Gyroscope Based on Smartphone"(2014).
- [10] <https://www.draw.io>.
- [11] <https://www.google.com>.
- [12] <https://www.sci-hub.com>.

[13] <https://ieeexplore.ieee.org/Xplore/home.jsp>.

## Plagiarism Report:

Quality Laser Cutter!

The first laser equipment producer and casting machine body in the world.

Bodor® Laser

OPEN

### Plagiarism Checker

Paste (Ctrl + V) your article below then click Check for Plagiarism!

**88% Unique Content**

#	String	Uniqueness
1	everyday life. The main reason for designing a real time	Good
2	around the world. Monitoring the road condition has acquired	Good
3	recent years.This work proposes detection of drivers drowsiness,rash	Good
4	drivers drowsiness,rash driving,accident detection,usage of	Good
5	driving,accident detection,usage of mobile phones and road condition	Good
6	on google map.With the help of the front camera of smart	Good
7	of smart phone, decreasing the possibility of accident by	Good
8	and the vehicle.This method is able to detect texting-while-driving(TD)	Already Exists
9	extra devices. A program which informs to the driver's	Good
10	driver's relatives,nearby police station,hospital by sending	Good
11	is worked on.System predicts the quality of the road based	Good
12	Blinking,driving,drowsiness,texting-while-driving,gyroscope	Good
13	drowsy driver, rash driver, road conditions and mobile	Good
14	threats life safety. When the reasons for traffic accidents are	Good
15	investigated, there is a major number of accidents total	Good
16	in the world. Safe car driving has become a priority in	Good
17	around the world. According to the world health organization	Already Exists
18	organization (WHO), most of the accident occurs because of traffic	Good
19	traffic accidents. In this method accelerometer sensor, gyroscope	Good
20	accelerometer sensor, gyroscope	Already Exists
21	of the driver. This work proposes a method to detect and	Good
22	road conditions. With the help of the camera, decreasing	Good
23	of the driver. When the driver becomes drowsy, their blinking	Good
24	becomes drowsy, their blinking pattern changes and accordingly	Good

Try New Document