RASH DRIVING DETECTION AND ACCIDENTAL AVOIDANCE

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Abstract: ***period abnormal driving behaviors observation might be an anchor to improving driving safety. Existing works on driving behaviors observation using smart phones only supply a coarse-grained result i.e. characteristic abnormal driving behaviors from normal ones to boost drivers' awareness of their driving habits therefore on stop potential car accidents, we would like to think about a fine-grained observation approach, that not only detects abnormal driving behaviors but in addition identifies specific varieties of abnormal driving behaviors i.e. Weaving, Swerving, side slippery fast reversion, Turning with a large radius and sudden braking. Through empirical studies of the 6-month driving traces collected from real driving environments, we tend to discover that everyone among the six forms of driving behaviors have their distinctive patterns on acceleration and orientation. Recognizing this observation, we tend to further propose a fine-grained abnormal Driving behavior Detection and identification system to perform real-time high-accurate abnormal driving behaviors observation using smart phone sensors. We tend to extract effective choices to capture the patterns of abnormal driving behaviors. After that, a pair of machine learning ways, rash driving, or officially driving under the Influence (DUI) of alcohol, can be a serious reason for traffic accidents throughout the globe. In this, we tend to tend to propose an extraordinarily efficient system geared toward early detection and alert of dangerous vehicle maneuvers typically related to rash driving. The whole solution wants only a mobile placed in vehicle and with accelerometer device. A program installed on the mobile automatically computes accelerations supported detector readings, and compares them with typical rash driving patterns extracted from real driving tests. Once any proof of rash driving is present, the mobile will automatically alert the driver or sends a message to predefined number in application for help well before accident actually happens.[1]***

Keywords- Mobile Sensing, Smartphone, IMU, Data, Driving Behavior, Insurance

I. INTRODUCTION

According to the statistics from World Health Organization (WHO), traffic accidents became one of the highest 10leading causes of death within the world [1]. Specifically, traffic accidents claimed nearly 3500 lives daily in 2014.Studies show that almost all traffic accidents are caused by human factors, e.g. drivers' abnormal driving behaviors. Therefore, it's necessary to discover drivers' abnormal driving behaviors to inform the drivers or report Transportation authority to record them. Though there has been works on abnormal driving behaviors detection, the main focus is on detection driver's status based on pre-deployed infrastructure, like alcohol sensor, infrared detector and cameras that incur high installation price. Since smart phones have received increasing quality over the recent years and mixed into our daily lives, a lot of and a lot of smartphone-based transport applications are developed in intelligent transportation. Driving behavior analysis is additionally a well-liked direction of smartphone-based transport applications. However, existing works on driving behaviors detection using smartphones will only give a coarse-grained result using thresholds, i.e. identifying abnormal driving behaviors from normal ones. Since thresholds could also be affected by automotive kind and sensors' sensitivity they cannot accurately distinguish the variations in varied driving behavioral patterns. Those solutions cannot offer fine-grained identification, i.e. distinctive specific kinds of driving behaviors. Moving on this direction, we want to think about a fine grained abnormal driving behaviors monitoring approach, that uses smart phone sensors to not only find abnormal driving behaviors however additionally determine specific kinds of the driving behaviors while not requiring any extra hardware's. The fine-grained abnormal driving behaviors observation is ready to enhance drivers' awareness of their driving habits as most of the drivers are over-confident and not alert to their reckless driving habits in addition, some abnormal driving behaviors are unapparent and simple to be neglected by drivers. If we are able to determine drivers' abnormal driving behaviors automatically, the drivers can be alert to their dangerous driving habits, in order that they will correct them, helping to stop potential car accidents. Furthermore, if the results of the observation might be passed back to a central server, they may be utilized by the police to observe rash-driving automatically or Vehicle insurance firm to research the policyholders' driving habits

II. EXISTING SYSTEM

The automatic rash driving detection system isn't present. Many accident happen because of rash driving. Existing works on driving behaviors observation using smart phones only offer a coarse-grained result an additionally in previous work uses an EGG instrumentality that samples the driver's EGG signals to find sleepiness during car driving. Uses infrared sensors observation the driver's head movement to find drowsy driving. Captures the driving force's facial pictures using a camera to find whether or not the driver is drowsy driving by image process. In, GPS, cameras, alcohol detector and measuring system device are wont to discover driver's status of drunk, fatigued, or reckless. However, the solutions all rely on pre-deployed infrastructures and extra hardware's that incur installation price.

III. LITERATURE REVIEW

According to literature survey after studying different IEEE paper, collected some related papers and documents some of the point discussed here:

1. Mobile Phone Based Drunk Driving Detection [9]

Author: Jiangpeng Dai, Jin Teng, Xiaole Bai, Zhaohui Shen,and Dong Xuan

Description: Drunk driving, or formally driving beneath the Influence (DUI) of alcohol, could also be a significant reason for traffic accidents throughout the earth. Throughout this paper, we've an inclination to propose a very economical system meshed toward early detection and alert of dangerous vehicle maneuvers usually related to drunk driving. The entire resolution wants alone a transportable placed in vehicle and with measuring instrument and orientation device. A program place in on the moveable computers accelerations supported device readings, and compares them with typical drunk driving patterns extracted from real driving tests. Once any proof of drunk driving is gift, the moveable will automatically alert the thrust or call the police for facilitate well before accident very happens. We've an inclination to implement the detection system on android G1 phone and have it tested with entirely different types of driving behaviors. The results show that the system achieves high accuracy and energy efficiency.

2. Context Aware Driver Behaviour Detection System in Intelligent Transportation Systems (ITS)[4]
Authors: Saif Al-Sultan, Ali H. Al-Bayatti and Hussien Zedan

Description: Vehicle accidental Networks (VANET) emerged as Associate in Nursing application of Mobile accidental Networks (MANET), that use Dedicated Short vary Communication (DSRC) to allow vehicles in shut proximity to talk with each other, or to talk with edge instrumentation. Applying wireless access technology in conveyance environments has light-emitting diode to the event of road safety and a reduction at intervals the vary of fatalities caused by road accidents, through the event of road safety applications and facilitating information sharing between moving vehicles with reference to the road. This paper focuses on developing a very distinctive and non-intrusive driver behavior notice particle system using a context-aware system in VANET to sight abnormal behaviors exhibited by drivers, and to warn various vehicles on the road so on stop accidents from happening. A five-layer context- aware style is planned that's able to gather discourse information concerning the driving setting, perform reasoning concerning certain and unsure discourse information and react upon that information. A probabilistic model supported Dynamic Bayesian Networks (DBN) for real time inferring four varieties of driving behavior (normal, drunk, reckless and fatigue) by combining discourse information concerning the actuation, vehicle and so the setting is bestowed. The dynamic behavior model can capture the static and so the temporal aspects related to the behavior of the actuation, thus, leading to robust and proper behavior detection. The analysis of behavior detection victimization artificial data proves the validity of our model and so the importance of moreover as discourse information concerning the actuation, the vehicle and so the setting

3. SenSpeed: Sensing Driving Conditions to Estimate Vehicle Speed in Urban Environments [7]
Authors: Haofu Han, Jiadi Yu, Hongzi Zhu, Yingying Chen, Jie Yang, Yanmin Zhu, Guangtao Xue and Minglu Li
Description:

Acquiring instant vehicle speed is fascinating and a corner stone to many necessary transport applications. This paper use smartphones different sensors to estimate the vehicle speed, significantly once GPS is out of stock or inaccurate in urban environments. Specifically, we've got an inclination to estimate the vehicle speed by event the accelerometer's readings over time and spot the acceleration errors can cause large deviations between the computable speed and thus the important one. Any analysis shows that the changes of acceleration errors unit of measurement really little over time which could be corrected at some points, observed as reference points, where existence vehicle speed is known. Recognizing this observation, we've got an inclination to propose associate correct vehicle speed estimation system, SenSpeed,\ that senses natural driving conditions in urban environments yet as making turns stopping and disbursal through uneven road surfaces, to derive reference points and any eliminates the speed estimation deviations caused by acceleration errors.

4. Driving Behavior Analysis with Smart phones: Insights from a Controlled Field Study [5]
Author: Johannes Paefgen, Flavius Kehr, Yudan Zhai, Florian Michahelles.

Description: We live a mobile application that assesses driving behavior supported in vehicle acceleration measurements and offers corresponding feedback to drivers. Inside the insurance business, such applications have recently gained traction as a viable numerous to the observation of drivers via "black boxes" place in in vehicles, that lacks interaction opportunities and is perceived as privacy intrusive by policy holders. However, cause uncertainty and completely different Noise inflicting factors build sensible phones in all probability less reliable as sensor platforms. We've a bent to therefore compare vital driving events generated by a Smartphone with reference measurements from a vehicle mounted foreign FTO in an exceedingly} very controlled field study. The study was designed to capture driver variability below universe conditions, whereas reducing the influence of external factors. We tend to discover that the mobile measurements tend to overestimate vital driving events, in all probability due to deviation from the tag initial device cause. Whereas weather and daytime do not appear to influence event counts, road type may be a significant issue that is not thought-about in most current state of-the art implementations.

IV. PROPOSE SYSTEM

Propose system wont to discover the rash driving if somebody detected as rash driver then system can inform to nearest police station regarding driver. To search nearest police station system use distance calculation formula. System utilize accelerometer to get the reading. Accelerometer provide value of X, Y, Z as per the motion of mobile. According to reading we are going to classify the driver is rash driver or not. Also application detect the accident with a help of accelerometer. If accident happen then it will send SMS to emergency number mention at the time of registration, it will also notify all the user in same area about accident by notification. So other user can redirect the root to avoid the traffic. It also detect traffic by identifying users speed. System collect the speed of users in same area, if all users travel with slow speed then it will notify as traffic. These traffic details will send to all the other user to avoid traffic.[9]

V. SYSTEM ARCHITECTURE

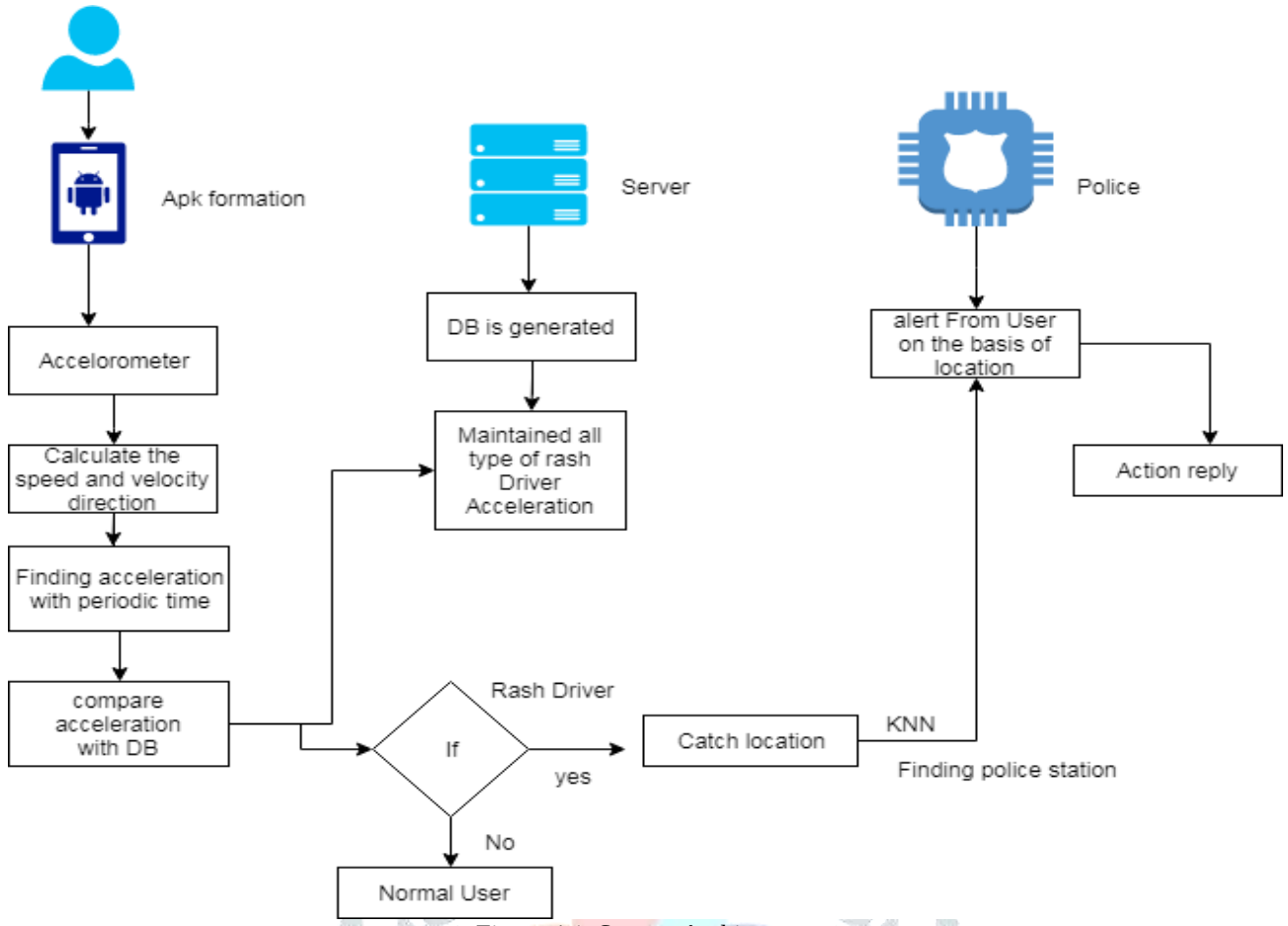
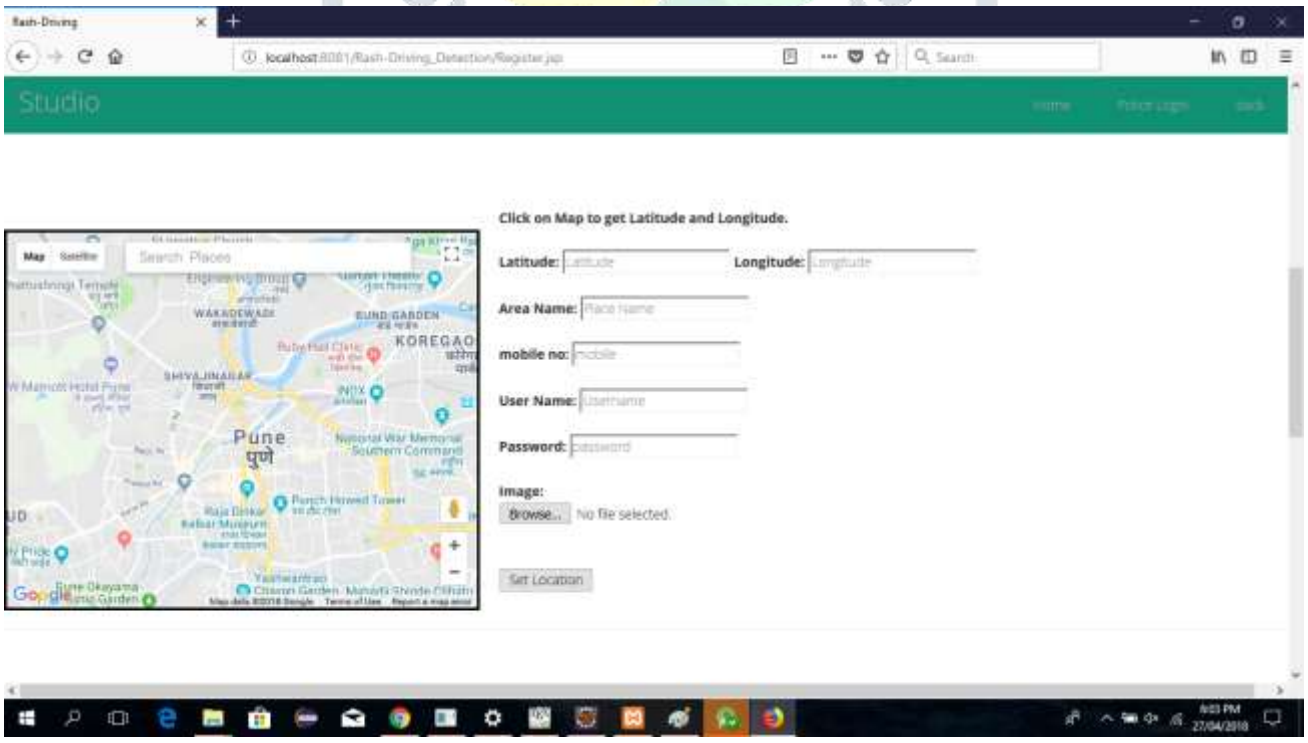
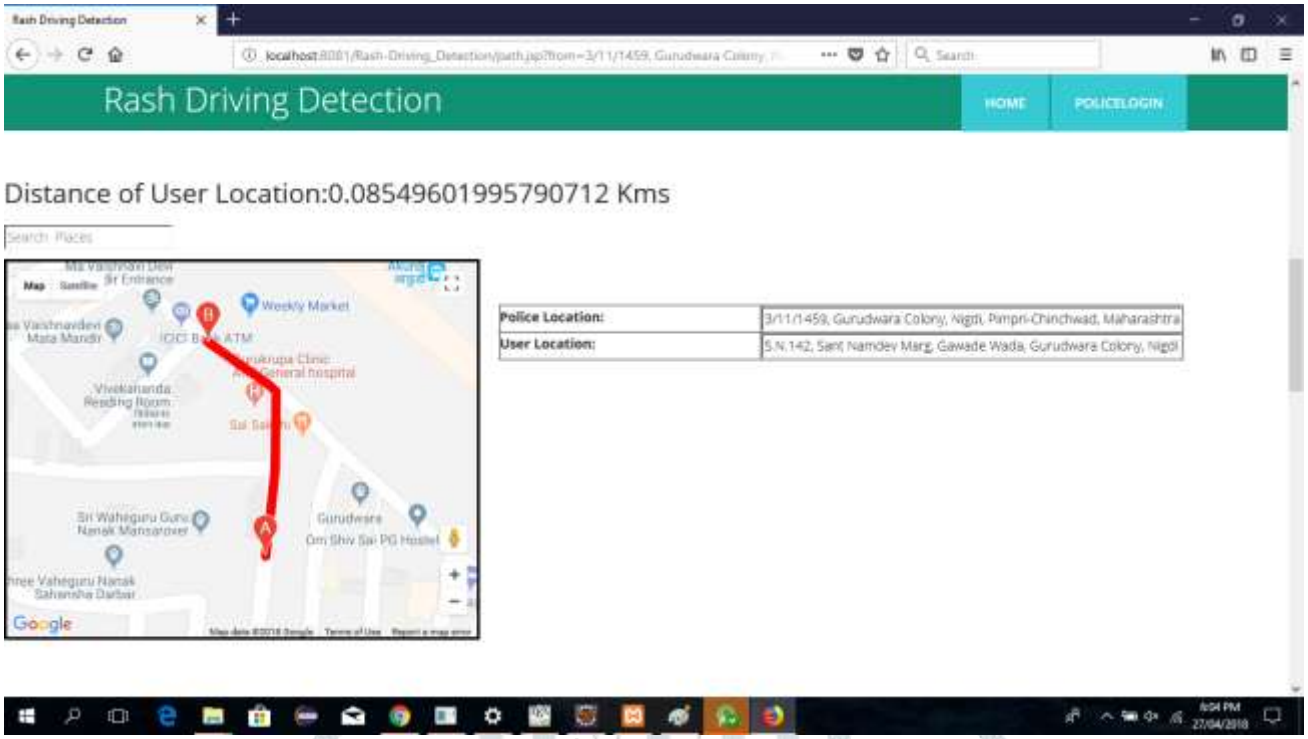


Figure 4.1. System Architecture

VI. RESULT



Screenshot 1



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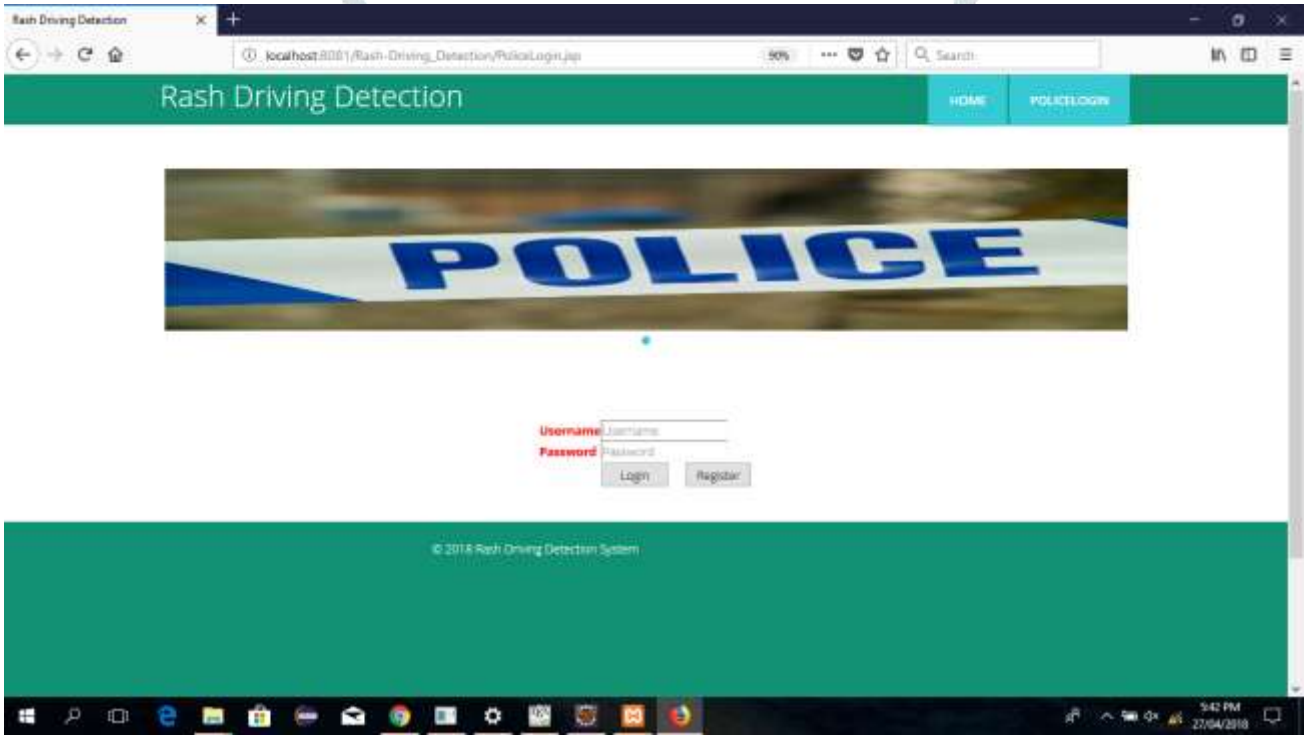

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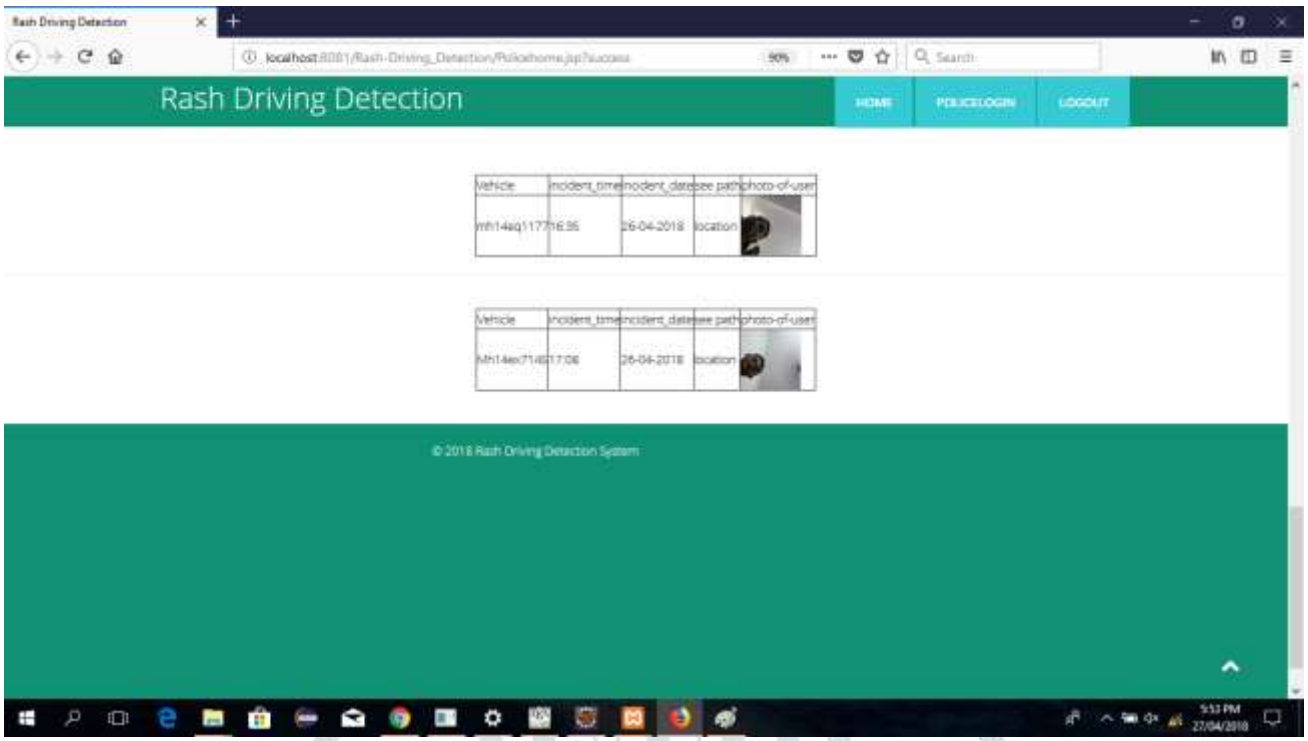
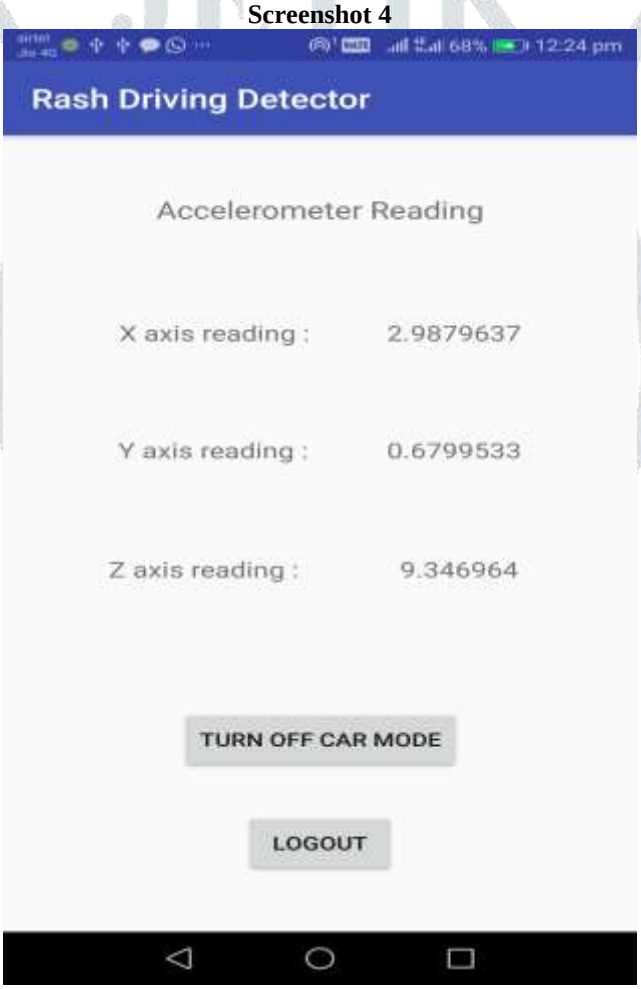


Screenshot 4



Screenshot 5

Screenshot 6

VII. CONCLUSION AND FUTURE SCOPE

In this paper, we present a highly efficient mobile phone based rash driving detection system. The mobile phone that is placed within the vehicle collects and analyzes the information from its accelerometer sensors to observe any abnormal and sends a message for help. We tend to address the problem of acting abnormal driving behaviors detection (coarse-grained) and identification (fine-grained) to enhance driving safety. During this paper, we tend to propose a system, to observe and determine specific kinds of abnormal driving behaviors by sensing the vehicle's acceleration and orientation using Smartphone sensors. Compared with existing abnormal driving detection systems, not only implements coarse-grained detections but additionally conducts fine-grained identifications.

VIII. REFERENCES

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