# The Exclusive Survey of Driving Pattern Detection System

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*Abstract*— Rash driving, or officially driving affected by liquor, is an anamnestic reason for car crashes all through the world. In this paper, we propose a profoundly productive framework went for early discovery and warning of hazardous vehicle moves commonly identified with alcoholic driving. The whole disposal requires just a cell phone set in vehicle and with accelerometer and introduction sensor. Subsequent to introducing a program on the cell phone, it will register increasing speeds dependent on sensor readings and contrast them and common dangerous driving examples removed from genuine driving tests. When any proof of alcoholic driving is available, the cell phone will consequently caution the driver or call the police for help a long time before mishap really occurs.

***Key words:*** Rash Driving Detection, Cell phone, Accelerometer

## I. INTRODUCTION

As per the gauge from World Health Organization (WHO), car crashes have turned out to be one of the best 10 driving reasons for death on the planet. In particular, car crashes persuaded about 3500 lives every day in 2014.Studies demonstrate that most auto renounter are caused by human variables, for example drivers irregular driving practices. Along these lines, it is important to identify driver's strange driving practices to alarm the drivers or report Transportation Bureau to record them.

This carcase utilized for appraise the surroundings of the vehicles and in this way magnify the wellbeing and creativeness of driving. It lies on critical capacity for different quittance like traffic signs, signs and people on foot are displayed. Casing work for coordination of sensors and control module in a multi-operator framework is given. A SMS which contains the present GPS area of the vehicle is sent to the police control space to caution the police. The framework is idiot proof and the driver can't mess with it effectively. In this way it gives a compelling and pecuniarily savvy answer for the issue of rash driving in vehicles.

## II. LITERATURE SURVEY

### *A. Mobile Phone Based Drunk Driving Detection*

Drunk driving, or officially driving under the (DUI) of alcohol, is a major cause of traffic accidents throughout the world. In this paper, we propose a highly efficient system aimed at early detection and alert of dangerous vehicle maneuvers typically related to drunk driving. The entire solution requires only a mobile phone placed in vehicle and with accelerometer and orientation sensor. A program installed on the mobile phone computes accelerations based on sensor readings, and compares them with typical drunk driving patterns extracted from real driving tests. Once any evidence of drunk driving is present, the mobile phone will automatically alert the driver or call the police for help well before accident actually happens. We implement the detection system on Android G1 phone and have it tested with different kinds of driving behaviors. The results show that the system achieves high accuracy and energy efficiency.

### *B. Context Aware Driver Behaviour Detection System in Intelligent Transportation Systems (ITS)*

Vehicle Ad hoc Networks (VANET) egress as a utility of Mobile Ad hoc Networks (MANET), which use Dedicated Short Range Communication (DSRC) to allow vehicles in close juxtaposition to communicate with each other, or to communicate with roadside instrumentation. Applying wireless access technology in conveyance environments has junction rectifier to the advance of road safety and a discount within the range of fatalities caused by road accidents, through the development of road safety applications and facilitating data sharing between moving vehicles relating to the road. This paper focuses on developing a completely unique and non-intrusive driver behaviour notice on system employing a context-aware system in VANET to detect abnormal behaviours exhibited by drivers, and to warn other vehicles on the road therefore on stop accidents from happening. A five-layer context- aware tectonics is proposed which is able to collect contextual information about the driving environment, perform reasoning about certain and uncertain contextual information. Probabilistic model supported Dynamic Bayesian Networks (DBN) for real time inferring four sorts of driving behaviour (normal, drunk, reckless and fatigue) by combining discourse data regarding the driver, vehicle and the environment is presented. The dynamic behaviour model can capture the static and the streaky aspects related to the behaviour of the driver, thus, leading to robust and accurate behaviour detection. The evaluation of behaviour detection using labored data proves the legality of our model and the importance of including contextual information about the driver, the vehicle and the environment.

## III. FUTURE SCOPE

This project involves the use of smartphone and inbuilt sensors to detect rash driving which makes it feasible and can be easily adopted by organizations which don't want to spend too much capital into the vehicles but still want to contribute to the security of its employees and other citizens on the road. The driving patterns and the modules present in the app can be easily modified and ported to other mobile platforms.

### *A. Proposed System*

We propose a system to detect rash driving using no additional hardware. The system is divided into three modules:

1) User Module
2) Server
3) Police Station

Fig. 1. Architecture Diagram

 

*1) User Module*

The user module will be responsible for real time monitoring and reporting of driving behaviour. User will login to an app present in smartphone equipped with accelerometer sensor. When driver starts driving the car, readings from accelerometer sensor will be taken periodically and pattern matching will be done. If rash driving pattern is found, user will be alerted and if user repeats rash driving, his GPS coordinates will be sent to the server.

*2) Server Module*

The server stores the data related to registered users, and the location of different police stations. The data set related to different types of driving patterns which are essential for pattern matching is also present at server. If rash driving pattern is detected at user module, server will use Haversine formula to find nearest police station and user data along with GPS coordinates will be sent to the police station.

*3) Police Station Module*

The police station module will receive information about rash driving including GPS coordinates of the driver and can take appropriate actions on the driver.

*B. System Architecture*

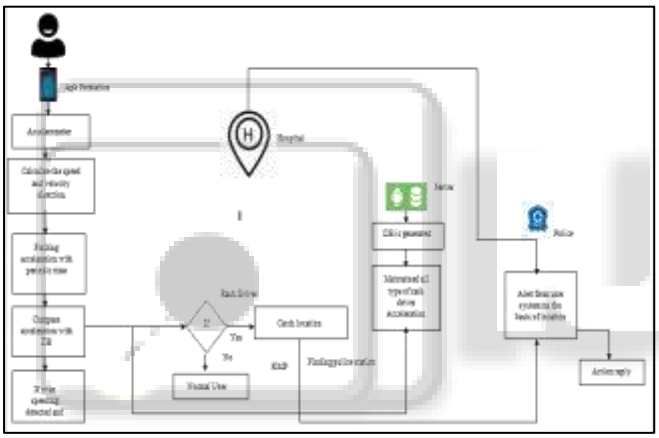

Fig. 1: System Architecture of Proposed System

*C. Algorithms*

*1) K-NN (K nearest Neighbour)*

In k-NN classification, the output is a class membership. An object is classified by a majority vote of its neighbours, with the object being assigned to the class most common among its k nearest neighbours (k is a positive integer, typically small).

If k = 1, then the object is simply assigned to the class of that single nearest neighbour.

1) Determine parameter K = number of nearest neighbours
2) Calculate the distance between the query-instance and all the training samples
3) Sort the distance and determine nearest neighbours based on the Kth minimum distance
4) Gather the category r of the nearest neighbours
5) Use simple majority of the category of nearest neighbours as the prediction value of the query instance.

*2) Accelerometer Algorithm*

1) Initialize
2) Get x coordinate
3) Get y coordinate
4) Get z coordinate
5) Extract Features of the environment.
6) Predict Motion states according to the features.
7) If rash driving found then inform police station.
8) Else, continue.
9) Stop.

*3) Haversine Algorithm*

Haversine formula is used for calculating distances between two coordinates on a spherical shape. It determines the great-circle distance between two points on a sphere given their longitudes and latitudes. It is especially very important in navigation.

1) Initialize
2) $\Phi 1$, $\Phi 2$ are latitudes of two points in radians
3) $\lambda 1$, $\lambda 2$ are longitudes of two same points respectively in radians
4) $\alpha = (\phi 1 - \phi 2) /2$
5) $\beta = (\lambda 1 - \lambda 2) /2$
6) $\alpha = \sin 2\ \alpha + \cos(\Phi 1) * \cos(\Phi 2) * \sin 2\ \beta$
7) $c = \sin(\text{minimum}(1, \sqrt{a}))$
8) $D = 2 * R * c$
   Where D is distance between those two points and R is the radius of Earth (6371.65 KM).
9) Stop

*D. System Specification*

*1) Hardware Requirements*

– System: Intel I3 Processor.
– Hard Disk: 40 GB.
– Monitor: 15 VGA Colour.
– Mouse: Logitech.
– Ram: 4 GB

*2) Software Requirements*

– Operating system: Windows 7.
– Coding Language: JAVA, ANDROID
– IDE: Android Studio
– Database: SQLite

## IV. Conclusion

The framework will be very productive cell phone based rash driving discovery framework. A cell phone, which is put in the vehicle, gathers and examinations the information from its accelerometer sensors to recognize any irregular or risky driving moves ordinarily identified with driving under liquor impact and sends ready message to driver and on the off chance that rash driving is rehashed, the information is send to the closest police headquarters which is discovered utilizing Haversine Algorithm. We address the issue of performing unusual driving practices location (coarse-grained) and ID (fine-grained) to enhance driving wellbeing. In future the distinguishing proof part can be additionally enhanced to help in forecast of mishaps dependent on information gathered from continuous identification.

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