

Alcohol Detection System using Smart Cab Application

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Abstract

We see many incidents that caused accident due to drivers' cell phone usage while driving. There are many systems in the market that detect the cellphone usage of human intervention. It is not possible not to let drivers use their cellphones. There are many solutions to the problem which is dependent on user's instructed input. User tend to give only rating to the cab driver, he can't do anything while he's having a ride. In this paper, we propose a system which is can recognize smart phone usage without using any hardware other than smartphone. The concept of the system is if any driver is texting or using his smartphone recursively, the smartphone integrated sensors (such as GPS, gyroscope and accelerometer) detect surrounding like touch strokes, the position of holding phone and speed of the vehicle. The readings will be observed to detect if there are recorded touch strokes on smartphone. There are many experiments performed under various person and various driving scenarios. The outcome of the experiments were pretty promising. The experiments showed that the technique is able to get better detection accuracy with low false positive rate. The system is totally free of infrastructure and conduct high accuracy, moreover the content of the smartphone usage have no access allowed and therefore it is also privacy preserving.

Keywords: Smartphone usage (TD), driver, user, mobile phone.

1. Introduction

Department of Transportation of U.S.A. reveals that in lot of vehicle accidents caused due to smartphones, around 13 lakhs of accidents. Among these accidents distracted driving actions associated with smartphones, usage of smartphone while driving (TD) is one of vulnerable activities which drivers do.

Many fascinating features and smartphone applications are implemented to trace and smartphone usage while driving TD. Though, for a smartphone usage while driving to be more real time, a key strategy is its ability to differentiate driver's smartphone from users or passengers. There are many solutions to the problem which is dependent on user's instructed input or uses any devices to detect if smartphone is at car's or host's location. In the project, we put forward an application which can detect smartphone usage while driving without any other hardware. The concept of the system is if any driver is texting or using his smartphone recursively, the smartphone integrated sensors (such as GPS, gyroscope and accelerometer) detect surrounding like touch strokes, the position of holding phone and speed of the vehicle. These patterns will be analyzed if these patterns match rash driving TD patterns. Many experiments have performed and in various driving scenarios. The outcomes show that it is able to get better detection. Moreover the content of the smartphone usage have no access allowed and therefore it is also privacy preserving.

2. Literature Survey

1. Yu-Ting Wen; Jinyoung Yeo; Wen-Chih Peng; Seung-Won Hwang, "Efficient Keyword-Aware Representative Travel Route Recommendation" - 2017

In this paper, author observed user's historical cell phone records in social media, he aims to discover travel experiences to enhance trip to go anywhere. While organizing a vacation, users have certain inclinations regarding their vacation. Rather than limited query options to user, we examine unpredictable text explanations about User specific demand. Also, various routes of approved travel set is important. To gain the feature of automated trip corporation, we affirm more features of places of interest(POI) to be extracted from it. Therefore in this paper, we present effective keyword aware Portrayal travel routes substructures that uses information removal from users past mobile records and Social interplay Explicit to it we have designed a keyword identification and removal module to classify all POI tags accordingly. Evaluation of successful and well organized presented algorithms, Adjunctive research on real location based Internet community dataset have been carried out and the experiment result show good performance.

2. Y. Artan, O. Bulan, R. P. Loce, and P. Paul, Driver cell phone usage detection from hov/hot nir images, in 2014 IEEE Conference on Computer Vision and Pattern Recognition Workshops, June 2014, pp. 225230.

This paper reveals that, drivers are easily getting distracted and increasingly costing problems like loss of lives and damage to property due to usage of cell-phone while driving. Thus this has developed a need for detecting of cell-phone while driving. Author proposed a concept for determining cell-phone usage while driving by using a infrared camera inbouded on the vehicle's dashboard.

3. Y. Wang, J. Yang, H. Liu, Y. Chen, M. Gruteser, and Martin R. P. Determining driver phone usage by detecting vehicle dynamics. 2013

This paper states the smartphone sensing according to the vehicle dynamics to determine the usage of smartphone by the driver while driving which increases the traffic safety. The system uses an inbuilt sensors present in the smartphones such as accelerometers and gyroscopes to capture the differences in centripetal acceleration due to vehicle's change in volume. This can be added into the angular velocity to determine position of the smartphone relative with vehicle. The low frequency approach captures different turn sizes and driving speeds. Sizeable experiments has been organized along with two vehicles at two different cities which proves that our system is reliable with real driving surrounding.

4. Chu H. L. , Raman V. , and et al. Poster: Are you driving ? We'll talk later then. In 2011

The author present a phone based sensing system used to determine if a person in a moving car is a cab-driver or a passenger. He realizes this goal using various mobile phone sensors without depending on wearable sensors or custom sensors in the vehicle. The detection is based on where the cab-driver is present or where the passenger is present in the vehicle's seating. The system foresee several useful applications for the DDS including, delivery of notifications (e.g., voice calls, emails, ads, etc.) based on availability of user attention, feeding the detection results into systems to compute commuting carbon footprints or for tracking reckless driving behavior, etc

3. Proposed system

We put forward a method to detect driver's activity while driving car. We put forward a method which can trace action of texting while driving without using any other device. The concept of the system is if any driver is texting or using his smartphone recursively, the smartphone integrated sensors (such as GPS, gyroscope and accelerometer) detect surrounding like touch strokes, the position of holding phone and speed of the vehicle. The main objective behind this project is to develop a security system that is designed to serve the purpose of providing security to Passengers so that they never feel helpless while facing Misbehavior of Driver. To develop application for securing the transport system so people can travel without any risk. We build our application with in Traveling scope where people need to travel in day to day life.

3.1 Classification of Drivers activity using GPS:

Using CAB driver mobile activity details we detect mobile location by using GPS and calculate speed per hour. Verification of activity. At the time of driving we take sensor details and analyze whether driver uses his mobile phone or not. Every time he gets fair the system will start analyzing driver behavior until ride get complete?

3.2 New application for Detecting CAB Driver:

User need to fill the details in the form such as: - name, contact no., address, CAB Details, Area. This information will then be analyzed to see whether there exist some specific T&D patterns. Extensive research have been organized by different citizens and in the different driving scenarios utilized with smartphones embedded sensors to infer touch strokes, which are directly linked with user's input-put approach can gain good accuracy along with low false positive rate. This proposed concept should not have access the content present in the text even in extreme high accuracy therefore this method is privacy-preserving.

3.3 Proposed system has following objectives:

- Find misbehavior of Driver while Driving
- Send immediate Notification to Head Office.
- Take Action on Driver
- Improve security of passengers

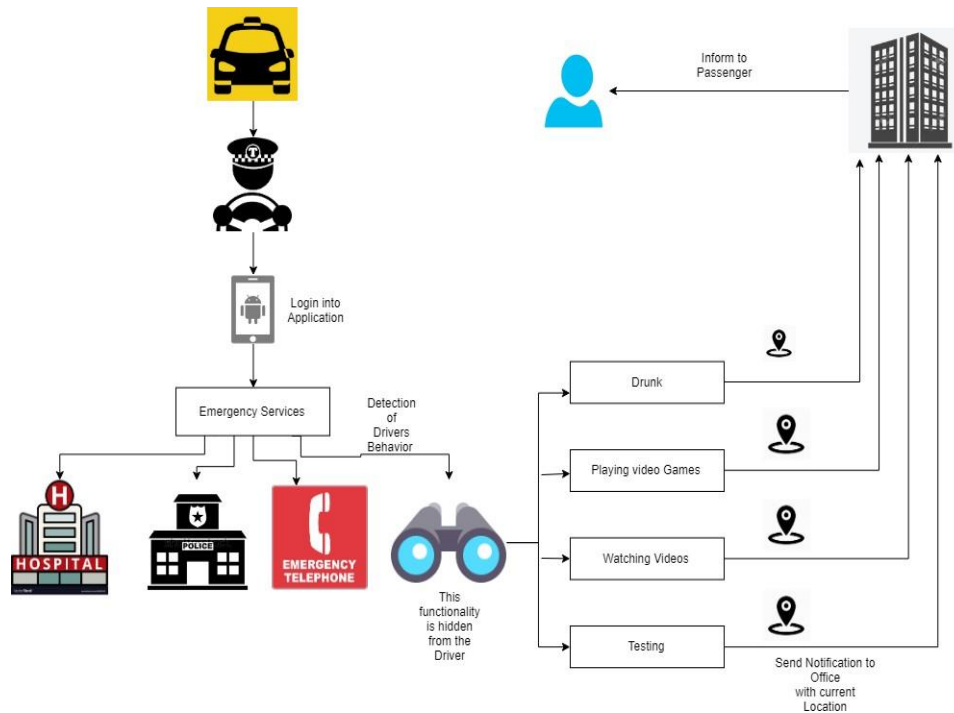


Fig 1: System Architecture

4. MATHEMATICAL MODEL

- Let Z be the whole system containing input, process and output of the system.
- $Z = \text{input, process and output}$. Where, input = is the set of inputs given to the system to achieve the problem statement. Process = is the procedure or the algorithm applied to the system which gives the expected output. output = is the output of the system
- Input = $S, U, A, R, P, N, \text{Avg}$. Let, 1. $S = \text{Drivers Activities}$.
- 2. $U = \text{be the set of users/Drivers}$. $U = u_1, u_2, u_3, \dots$
- $\dots \dots u_n$.
- 3. $A = \text{be the set of Miss Behavior activities}$. $A = a_1, a_2, a_3, a_n$.
- Let U_1, U_2, U_N be the set of users, providing the registration and getting used system daily. After verify the registration id, access will be given to the specified user. Administrator will update the information regarding the material taken by the users.
- P is process which monitors user's behavior and gets details by internal sensors and GPS and provides data to Output System a act as administrator who get all information about drivers behavior and using input data it generates report and send warn notification to CAB owner and drivers.

4. CONCLUSION

In this project, we proposed System to detect use of mobile. We are submitting a novel method to make it simple. Here we are using the authority method with some patterns that will guide us how smart phones are used in moving vehicles. The associated information about some build in sensors in the smart phones was collected and these sensors are analyzed with hypothesis testing and checked for T&D patterns match. The outcome of this approach will achieve good detection accuracy. There are many anti texting and driving smartphone application is sustain with this method.

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