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Detecting of Rash Driving using Rescue System

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Abstract:

Real-time anomalous driving behaviors monitoring is a corner stone to improving driving safety. Existing works on driving behaviors monitoring using smart phones only provide a coarse-grained result, i.e. distinguishing anomalous driving behaviors from normal ones. To improve drivers' responsiveness of their driving habits so as to prevent potential car accidents, we need to judge a fine-grained monitoring approach, which not only detects anomalous driving behaviors but also identifies specific types of anomalous driving behaviors, i.e. Weaving, Swerving, Side slipping, Fast U-turn, Turning and rapid braking. We intend a highly efficient system aimed at early detection and alert of dangerous vehicle maneuvers typically related to drunk driving. The entire solution for this only a mobile phone placed in vehicle and with accelerometer sensor. A program installed on the mobile phone computes accelerations based on sensor readings, and compares them with usual drunk driving patterns extracted from actual driving tests.

Keywords

Rash Driving, Three-axis accelerometer, Gyroscope, Android-based smart phone with GPS.

Introduction

According to the information from World Health Organization (WHO), traffic accidents have become one of the top 10 important causes of death in the world.Using data from the National Highway Traffic Safety Administration, data analysts used the total number of car-related dead for each state from 2000 to 2015 to rank the deadliest states for car accidents. They then found the average number of fatalities each year per 100,000 people. States are ranked by the average fatalities per year, from least to most dangerous .e.g. drivers' anomalous driving behaviors. Therefore, it is necessary to detect drivers' anomalous driving behaviors to alert the drivers or report Transportation Bureau to record them,Although there has been works on anomalous driving behaviors detection, the focus is on detecting driver's status based on pre-deployed infrastructure, such as alcohol sensor, infrared sensor and cameras, which incur high installation cost. Since Smartphones have received increasing popularities over the recent years and blend into our daily lives, more and more Smartphone-based vehicular applications are developed in Intelligent Transportation System. Driving behavior analysis is also a admired direction of Smartphone-based vehicular applications. However, existing works on driving behaviors detection using Smartphones can only supply a coarse-grained result using thresholds, i.e. distinguishing anomalous driving behaviors from normal ones. Since thresholds may be affected by car type and sensors' sensitivity, they cannot accurately distinguish the differences in various driving behavioral patterns. Since, Those solutions cannot provide fine-grained identification, i.e. identify specific types of driving behaviors. Moving along this direction, we need to consider a fine-grained anomalous driving behaviors monitoring approach, which uses Smartphone sensors to not only detect anomalous driving behaviors but also make out specific types of the driving behaviors without requiring any additional hardwares. The fine-grained anomalous driving behaviors monitoring is able to improve drivers' awareness of their driving habits as most of the drivers are over-confident and not aware of their reckless driving habits. Additionally, some anomalous driving behaviors are unapparent and easy to be ignored by drivers. If we can identify drivers' anomalous driving behaviors automatically, the drivers can be aware of their bad driving habits, so that they can correct them, helping to prevent potential car accidents. Furthermore, if the results of the monitoring could be passed back to a central server,they could be used by the police to detect drunken-driving automatically or Vehicle Insurance Company to analyze the policyholders' driving habits. According to , there are six types of anomalous driving behaviors defined *Weaving* is driving alternately toward one side of the lane and then the other, i.e. serpentine driving or driving in Sshape;*Swerving* is making an abrupt redirection when driving along a generally straight course; *Sideslipping* when driving in a generally straight line, but deviating from the normal driving direction; *Fast U-turn* is a fast turning in U-shape, i.e. turning round

(180 degrees) quickly and then driving along the opposite direction; *Turning with a wide radius* is turning/This work uses Smartphone sensing and machine learning techniques. By extracting unique features from the readings of Smartphone sensors, we can detect and identify the six types of anomalous driving behaviors above. To realize a fine-grained anomalous driving behaviors detection and identification, we face the following great challenges. First, patterns of driving behaviors need to be identified from readings of Smartphone sensors. Second, the noise of Smartphone sensors' readings should be removed. The fine-grained anomalous driving behaviors monitoring is able to improve drivers' awareness of their driving habits as most of the drivers are over-confident and not aware of their reckless driving habits. Additionally, some anomalous driving behaviors are unapparent and easy to be ignored by drivers. Finally, the solution should be lightweight and computational feasible on Smartphones. In this paper, we first set out to investigate effective features from Smartphone sensors' readings that are able to depict each type of anomalous driving behavior. Through empirical studies of the 6-month driving traces collected from Smartphone sensors of 20 drivers in a real driving environment, we find that each type of anomalous driving behaviors has its unique patterns on readings from accelerometers and orientation sensors. By extracting unique features from readings of Smartphones accelerometer and orientation sensor, we first identify 16 representative basic features to capture the patterns of driving behaviors, then generate 136 polynomial features based on the 16 features, and obtain 152 features in total. Then, we train those features through two machine learning methods respectively, *Support Vector Machine* (SVM) and *Neuron Networks* (NN), to generate a classifier model which could clearly identify each of driving behaviors (i.e. the normal driving behaviors as well as the six types of anomalous ones). Based on the classifier model, we propose an anomalous *D*riving behavior *D*etection and i*d*entification system, *D*3, which can realize a fine-grained anomalous driving behaviors detection and identification in real-time using Smartphone sensors. Our prototype implementation of *D*3 on Android-based mobile devices verifies the feasibility of using *D*3 in real driving environments.

2.Working

Existing System:

The automatic drunk driving detection system is not present. Lots of accident happen due to drunk driving. Existing works on driving behaviors monitoring using smart phones only provide a coarse-grained result and also in previous work uses an EGG equipment which samples the driver's EGG signals to detect drowsiness during car driving. uses infrared sensors monitoring the driver's head movement to identify drowsy driving. captures the driver's facial images using a camera to detect whether the driver is sleepy driving by image processing. In GPS, cameras, alcohol sensor and accelerometer sensor are used to identify driver's status of drunk, fatigued, or reckless. However, the solutions all rely on pre-deployed infrastructures and additional hardwares that incur installation cost. Moreover, those additional hardwares could go through the difference of day and night.

Disadvantage:

- Bad weather condition
- High maintenance cost
- It is time Consuming
- Error-prone
- Required more time for detecting rash driver.

Proposed system:

Our work uses Smartphone sensing and machine learning techniques to realize a fine-grained anomalous driving behaviors detection and identification. Although machine learning technique already is used to some activity recognition work our work is first to identify driving activities using machine learning technique. In activities are instantaneous, pattern of activities is simple. So features of activities' pattern would be identified easily. However, in real driving environments, since the time duration of some driving behavior is long, not instantaneous, such as Weaving, the system need to determine the beginning and ending of the driving behavior first. Extracting and selecting effective features of each type of anomalous driving behavior would be more complex.In this section, we first describe the data collection process for driving behavior samples from real driving environments. Then we examine patterns of each type of driving behavior from Smartphone sensors readings. Each driver fixes a Smartphone in his/her vehicle within daily natural driving. The 20 drivers keep collecting data in their daily driving, including commute to work, shopping, touring and so on. Those 20 drivers live in different communities and they have different commute routes. On standard , each driver may drive 60 to 80 kilometers per day. 20 Smartphones of 5 different types are used in our data collection After that, we ask 9 experienced drivers to watch the videos recorded by the Car DVR and recognize all types of anomalous driving behaviors from the 6-month traces, i.e. Weaving, Swerving, Sideslipping,

Fast U-turn, Turning with a wide radius or Sudden braking.

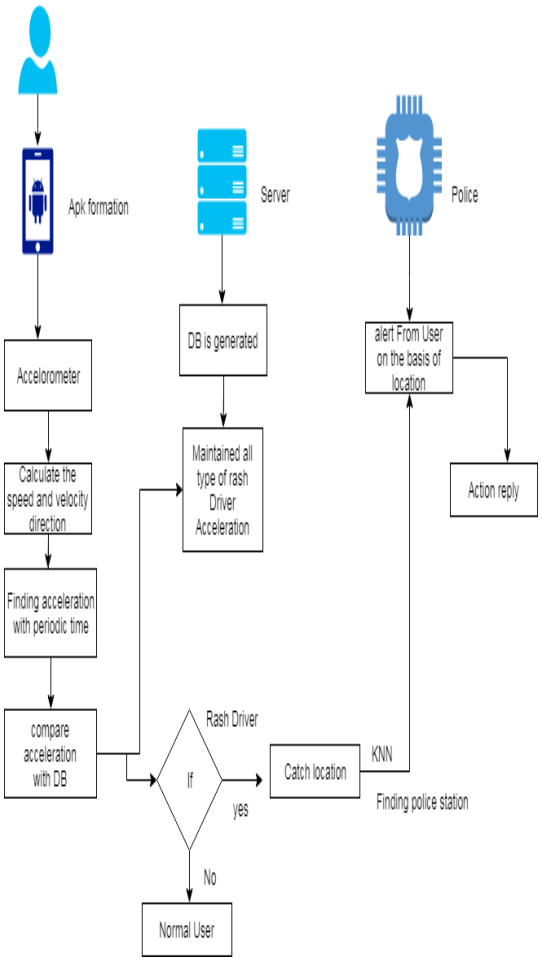
Advantage of proposed System

- Our system is built on fully automated system
- Uses the accelerometer sensors from Smartphone to match the Drunk and drive pattern.
- Automatically sends alert message for User.
- Displays on the Screen a message.

Applications:

- Detect drunk driver at crowded areas such as highway etc.
- It is also used for school buses
- It is also used in private sectors such as company buses, cabs etc.
- It is also used in public transport services.

3.System Architecture



4. Conclusion:

In this paper, we present here a highly efficient mobile phone based drunk driving detection system. The Smart phone, which is located in the vehicle, gather and analyzes the data from its accelerometer sensors to detect any abnormal or dangerous driving maneuvers typically related to driving under alcohol manipulate and sends a message for help. We address the problem of performing abnormal driving behaviors detection (coarse-grained) and detection (fine-grained) to improve driving safety. In particular, we propose a system, to detect and identify specific types 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 problems detections but also conducts fine-grained identifications

References

1.Yue Kang1, and Hang Yin2, and Christian Berger "Test Your Self-Driving Algorithm: An Overview of Publicly Available Driving Datasets and Virtual Testing Environment",2018

2.Anirban Dasgupta ,Daleef Rahman, and AurobindaRoutray "A Smartphone-Based Drowsiness Detection and Warning System for Automotive Drivers "2018

3.Yu, Zhongyang Chen, Yanmin Zhu, Yingying Chen, Linghe Kong and MingluLi ,"Fine-grained Abnormal Driving Behaviours Detection and Identification with Smartphones" ,IEEE Transactions on Mobile Computing Volume: 16, Issue: 8, Aug. 1 2017.

4. Manish R. Prabhu1 , Dipika P. Deorukhakar2 , Swati R. Amberkar3 , Komal J. Ambre4iew " A Revon Rash Driving Detection and Alert System" ,,2016

5.Amol Lakhe, Chintan Patel, Harshada Raut, Suwarna Shinde " Smart Phone based Rash Driving Detect" November 2017