A Mobile Application for Monitoring Inefficient and Unsafe Driving Behavior

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***Abstract*— Now a day's taxi businesses are at good boom. Many taxi companies are expanding as it has been become most profitable and safe business. But the main problem which taxi business owner face is driver's vehicle handling, so for the safety of vehicle and passenger it is need of a device which can monitor the activity of the drivers and vehicles. This paper proposes the practical and economic measure and alert derives of in inefficient and unsafe driving. The objective of this research is to show that automobile drivers are aware of the driving behavior and habits that can lead to inefficient and unsafe driving. However, it is often the case that these same drivers unknowingly exhibit this inefficient and unsafe driving behavior in their everyday driving activity. This paper provides a surveyon a knowledge-based framework for a driving assistance via smart phone. Vehicle information extracted through On Board Diagnostics(OBD-II) protocol, data acquired from smart phone .Recently, in the mobile device with the information market, several applications have emerged that pair the power of a mobile device with the information available through the use of OBD-II reader..**

Keywords- On Board Diagnostics, Data,Smart phone, Inefficient and unsafe driving , Mobile applications .

Introduction

Driver safety monitoring is not only important for fleet management, but also for monitoring new drivers and assessing performance of drivers during training sessions. Driving safety can be inferred from driver style, which is characteristically classified as either typical (non – aggressive) or aggressive. In order to overcome the high cost of these

commercial systems, we have created a novel application for both determining a driver's style (non-aggressive vs. aggressive),as well as recognizing types of driving events using only the sensors on a mobile phone.[3]There are lots of researches related to driving safety presented in past decade. This paper provides survey on a knowledge-based framework for a driving assistance via smart phone. Vehicle information extracted through On Board Diagnostics (OBD-II) protocol, data acquired from smart phone embedded micro-devices and information retrieved from the Web are properly combined. Data fusion and classification algorithms allow identifying and annotating relevant contexts and events in real time and semantic based matchmaking is exploited to infer functional situations.[4].On Board Diagnostics ,version 2(OBD-II)protocol(http://www.arb.ca.gov/msprog/obdprog/obdprog.htm)and be equipped with an OBD-compliant interface to provide direct and standard access to data in the internal automotive network.[1].These are several measurements, which can be used alone in combination , that can help indicate if a driver is driving unsafe or inefficiently .A small subset of these measurement includes:[2]

- Acceleration Deceleration
- Vehicle Speed
- Detection of Faults in Safety or Mechanical Equipment
- Environment Condition (e.g. Traffic Weather)
- Rate of Fuel Consumption
- Engine RPM

Although these measurements can help determine the safety and efficiency of driving activity, there is a practical way to capture and display these data to everyday to driver in a way that can impact the driver's behavior in real time or it could be examined and reflected on a historical sense [4].

I. LITERATURE REVIEWS

In 1996 and newer vehicles with OBD-II, there are no manual flash codes. We must have a code reader or scan tool to read the codes. The most basic diagnostic tool is a code reader. A code reader can access and display codes from your vehicle's computer. The least expensive models only display a number while the better ones also provide a definition. A code reader can also clear codes to turn off the Check Engine light. But a code reader is NOT a scan tool because it only reads and clears codes. It does NOT display any sensor data or other system operating information. To read sensor and other system data, you need some type of scan tool or scanner software .An important point to keep in mind here is that a fault code by itself does NOT tell you which part needs to be replaced. The code only tells you that a fault has been detected, not what caused it. The code serves as a starting

point for further diagnosis. Many people don't understand this and assume an inexpensive code reader is all they need to "diagnose" and repair their vehicle.

SCAN TOOLS: For advanced diagnostics on today's vehicles, a full feature scan tool is an absolute must. Scan tools for do-it-yourselfers can display sensor values and system data, but 3 scan tools cannot perform various system self-tests such as checking the operation of the fuel pump, cooling fan(s), idle speed control motor, , A/C compressor clutch, fuel injectors, etc. This level of diagnostics requires a professional level scan tool (which are EXPENSIVE!) and the proper software for accessing and running these types of tests. Scan tools have different ranges and capabilities. They can read and clear codes, display the status of the various OBD II system monitors, and display basic operating data such as loop status (Open or Closed), airflow, coolant temperature, oxygen sensor outputs, throttle position and other sensor readings, and fuel trim values for diagnostic purposes. Most of these tools are fairly versatile and work on all makes (Ford, GM Chrysler), but may require additional software for Asian and/or European applications. Entry level scan tools that are sold in auto parts stores are usually designed for do-it-yourselfers. They may also display only a limited number of "PIDs" (Performance Information Data such as sensor values, switch status and other operational data) compared to a professional level scan tool or factory scan tool.

II. PROPOSED SYSTEM

OBD based systems for vehicle monitoring and alert refers to remote and On Board solution in the former type [3, 4], GPS data and vehicle OBD DTCs are sent to a maintenance Center servers and stored into a database, which is scanned by a diagnostics expert system that and stored into database, which is scanned by a diagnostics expert system that generates a rough suggestion to advise the maintenance technicians. Information processing refers to a smartphone application and then it better resembles an on-board approach. Consider that, through useful for managing vehicle fleets, remote monitoring does not allow direct driver assistance. Now a days freeware and commercial software packages are available ,that allow to monitor OBD-II vehicle data by using just a smart phone .To the best of knowledge, all exiting on-board monitoring system directly display the acquired low-level data. They do not analyze the information to provide more meaningful and user friendly indications, through researchers have widely acknowledged the possibility to exploit the wealth of real time vehicle data available through OBD in order to analyze driver behavior[11].Current efforts aim to use multi-source information fusion to better interpret the relationships between driving habits and vehicle performance ,as well as to detect risk situation [1].

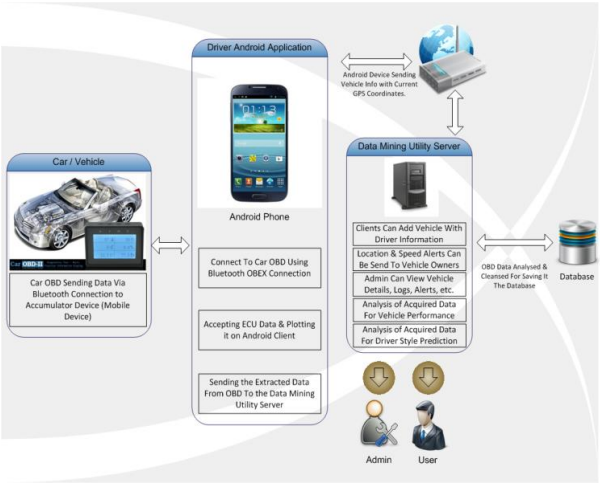

Figure 1:Block Diagram of Proposed System

IV ALGORITHM

K-means algorithm solves the well-known clustering problem. The algorithm is composed of the following steps:

- Place K points into the space represented by the object that are begin clustered .These points represent initial group centroids.
- Assign each object to the group that has the closest centroid.
- When all objects have been assigned, recalculate the position of the K centroids.

Repeat steps 2 and 3 until the centroid no longer move. This produces a separation of the object into group from which the metric to be minimized can be calculated.

III. CONCLUSION

The paper gives the knowledge-based framework and a prototypical system for real-time driving assistance. They refer to every OBD based vehicle and comply with several driving context without the need of learning stages. By means of information extracted through the accelerometer and GPS embedded in Android based smart phone and exploiting Web-based available services, a context annotation is performed. It enable semantic-based inferences which finally provide useful recommendations for driving safely. Experimental evaluation evidenced that the system is able to detect a variety of road and traffic condition, as well as driving behavior, issuing accurate suggestion to minimize risk factors. The prototype will be successful in providing a user-friendly method to make drivers aware of unsafe and inefficient driving practices. Also , the application provided a unique Historic view that allow a user to reflect in their own historical patterns of inefficient and unsafe driving. This application, combined with a smartphone and an OBD-II reader , is one of the few practical opportunities a driver may have to monitor , reflect on and improve their overall driving behavior.

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REFERENCES

[1] Ruta,M.Scioscia,F.,Gramegna,F.,Di,Sciascio,E:."Knowledge-basedReal –Times car Monitoring and Driving Assistance." Politechico di Bari,via Re David 200I-79123 Bari, Italy(2012)

[2] PiyushK.Ingole(2014). Smart 802.11P Vehicle to Infrastructure Communication Vision and Image Understanding,115(4):541 – 558, 2011.

[3] C.Campolo,A.Lera,L.Militano,andMolinaro,"Scenarioa-Adaptiveanand Gain-Aware Content Sharing Policies for Cooperative Wireless Envrionemnt,"vol.35,no 10 ,pp.1259-1271,2012.

[4] Chen,Y.,Xiang,Z.,Jian,w.,Jiang,W.,"Design and implementation of multisource vehicular information monitoring system in real time. In "Automation and Logistics, 2009.ICAL'09.IEEE International conference on. (AUGUST 2009)1771-1775.

[5] A.Doshi and M.Trivedi,"Communicating driver intents: layered architecture for cooperative actives safety application," in IEEE Intelligent Transportation System Conference, sep 2010.

[6] M.M.Trividi and S.Y.Cheng "holistic sensing and display for intelligent driver support system",IEEE Computer Magzine,2007.

[7] Kargupta ,H.,Bhargava , R.,Liu.,Power,M.,Blair,p.,Bushra,D.,Vedas"Amobile and distributed data stream mining system for real-time vehicle monitoring .In Berry,M.,Dayal,U.,Kamath,C.,Skillicorn, .D.B.,eds.:SDM,SIAM(2007)

[8] Choi,S.,Kim ,J.,Kwak,D.,Angkititrakul , p., Handy,D.,Angkititrakul,P.,Hansen,J..Analysis and classification of driver Behavior using In-Vehicle CAN –bus Information .In:Beinnial Workshop on DSP for In-Vehicle and mobile systems.(2008)

[9] phone based approach to monitor driving behavior and sharing of statistic.4th International conference on driving style 2014.

[10] DerickA.Johnson and Mohan M.Trivedi:"Driving style recognition using a smart phone as a sensor platform". Laboratory for Intelligent and Safe Automobiles (LISA) university of California, CA92093-0334(2011).

[11] Adnan K Shaout and Adam E.Bodenmiller:"A Mobile Application for Monitoring Inefficient and unsafe DrivingBehavior "University of Michig.n-Dearborn 48128(2011).

[12] J.Gozn in urban Environment ",vol . 50,no.5,pp.176-183,may 2012.alvez,M.Sepulcre and R. Bauza,"IEEE