

Detection of Driving Behaviors by using OBD Simulator

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Abstract— Nowadays, with the increasing variety of vehicles drawback arises a way to manage and keep a watch on driving behavior of the folks. Several systems area unit projected however none is economical and straightforward to implement in world. so there's would like for development of value economical and real time system that may be enforced virtually with each automobile. Use of Smartphone is increasing as quickly as forest fires. Options accomplished with Smartphone will be utilized in higher manner in development of latest systems. OBD (On-Board diagnostics) device in association with the Smartphone application will be combined into one system to diagnose driving behavior. OBD device provides real time data About Engine management unit. At the side of driving behavior we are able to get data regarding fuel consumption rate etc. We have projected a client-server real time automobile observance system which might be employed by automobile dealing corporations to manage their rented cars and a knowledge-based framework for a driving help via Smartphone

Keywords: - *Hadoop, OBD, Simulator Smartphone*

1. INTRODUCTION

On-board nosology (OBD) is AN automotive term concerning a vehicle's self-diagnostic and news capability. OBD systems offer the vehicle owner or repair technician access to the standing of the assorted vehicle subsystems. Project proposes a sensible and economical thanks to capture / value inefficient, uneconomical and unsafe driving with the main points regarding Performance, nosology (Using nosology bother Code - DTC), Fuel Consumption & Autonomy and Emission from a Vehicle. Smartphone application is negotiator for info transfer from OBD machine to the server finish and Computation half are going to be enforced by exploitation agglomeration algorithmic program k-means and Driver's rash driving are going to be known. Data fusion and classification algorithms permit characteristic and annotation relevant contexts and events in real time and semantic-based matchmaking is exploited to infer purposeful things. The planned approach has been enforced in AN automaton application, and evaluated in real-world take a look at drives. Solely constraints are accessibility of web, no different person than administrator ought to be allowed to

access the server finish; driver ought to have information regarding the way to access Smartphone application. This method is price economical and straightforward to implement with little or no hardware necessities. Hadoop is employed for computation at server facet as real time knowledge regarding location, rev of each vehicle is huge knowledge and as ancient knowledge computing tools can't handle huge knowledge.

2. LITERATURE SURVEY:

Knowledge-based period of time automotive observation and driving help (2012):

Modern vehicles at equipped with many Electronic management Units (ECUs) coordinating and observation internal elements and subsystems, act over one or additional automotive network buses. specially, international rules these days mandate all new vehicles should support the On Board medicine, version a pair of (OBD-II) protocol and be equipped with associate degree OBD-compliant interface to produce direct and normal access to information within the internal automotive network. What is more, just in case of malfunctions, Diagnostic hassle Code (DTC) values ar hold on within the automotive eu and may be later retrieved by maintenance technicians mistreatment correct tools. Recently, access has been granted conjointly to the final public of automotive enthusiasts by the event of OBD-II scan tools, low-cost electronic devices that bridge the OBD-II port with normal wired (RS-232, USB) or wireless (Bluetooth, IEEE 802.11) pc communication interfaces. This paper enhances framework in, able to interpret vehicle information extracted via OBD-II, integrate environmental info and notice potential risk factors. Besides providing warnings for that, currently the system offers suggestions throughout driving and evaluates automotive potency and environmental impact.

Smart phone primarily based approach to watch driving behavior and sharing of data point (2014):

In recent year several scientist and industries ar acting on VANET and attempting to implement the ideas in planet. Several VANET systems are planned and tested on simulation however only a few inventors enforced it. Transport unintended networks (VANETs) are being developed to produce on demand wireless communication infrastructure among vehicles and authorities. Such associate degree infrastructure is anticipated to deliver

multiple road safety and driving help applications. Vehicles are going to be equipped with sensors and communication devices which will permit them to collaborate with one another. Vehicles will exchange completely different kind of info as per needs on demand for nominal application. With the aim of supporting and up information assortment and distribution, during this paper a sensible phone-based platform is intended that exploits affordable dedicated hardware to move with sensors on board and within the vehicle surroundings

A Mobile Application for observation Inefficient and Unsafe Driving Behavior (2012)

Recently, within the mobile application market, many applications have emerged that try the ability of a mobile device with the data offered through the employment of associate degree OBD-II reader. These applications tend to be directed toward automotive vehicle enthusiasts, developing options that think about measure vehicle performance and troubleshoot mechanical problems. Alternative applications ar egression that specialize in environmental considerations. These applications think about factors like measure a driver’s carbon footprint and fuel consumption. A number of these applications embrace options that may notice safety issue (e.g. problems with the vehicle’s stability management system). However, these options ar centered on detective work mechanical problems with safety instrumentation, not on distinguishing real time considerations with the driver’s behavior or setting.

In existing system, we discover there's a possible in victimization mechanical phenomenon sensors to totally differentiate between different drivers. Whereas options related to acceleration events failed to play a significant role in differentiating between drivers, features, GPS location. Considering these Parameters we've got planned new Driver’s behavior detection system. In existing system with the assistance of acceleration, braking and standardization events we tend to establish changes between totally different drivers in driving designs. Here, unattended rule k-means clump rule is employed and supervised rule Support Vector machine is employed for computation. Human identification victimization mechanical phenomenon sensors and Detection of driving behavior and classification by victimization mechanical phenomenon sensors area unit the most tasks of this technique. Histograms of applied mathematics info area unit created however does not yield abundant vital info.

3. PROPOSED SYTEMS

Proposed System consists in the main of:

- Server finish with Hadoop technology
- ODB machine
- Android Smartphone

OBD impacts several audiences for various reasons.

- For Repair Technicians:
OBD could be a valuable tool that assists within the service and repair of vehicles by providing a straightforward, quick, and effective thanks to pinpoint issues by retrieving important automobile diagnostics from the OBD systems.
- For State Agencies:
OBD plays a vital role wherever vehicle examination and maintenance programs are needed.
- For Vehicle Owners:
OBD is AN early warning system that alerts you to the potential would like for vehicle repair through the "Check Engine" light-weight on the dashboard of your vehicle.
- For Vehicle and Engine Manufacturers:
OBD systems are needed by independent agency to be put in on light vehicles and trucks, further as heavy-duty engines

Communication networks used are;

- Bluetooth
- Internet



Figure 1: Architecture of proposed system

Architecture of projected system

Advantages:

- Less time is needed to urge location of drivers on totally different cars at same time
- The entire system may be enforced in an exceedingly } very low price.
- High security is provided.
- Alarm system is employed once any quite rash driving is detected.
- Continuous and real time observation is provided.

Applications:

- Car transaction firms like Uber, Zoom automobile etc.

- Car Driving colleges
- School and faculty buses observation
- Other eventualities wherever multiple cars are to be managed.

- designed to have:
 - resistance against known attacks
 - speed and code compactness on many CPUs
- Design simplicity

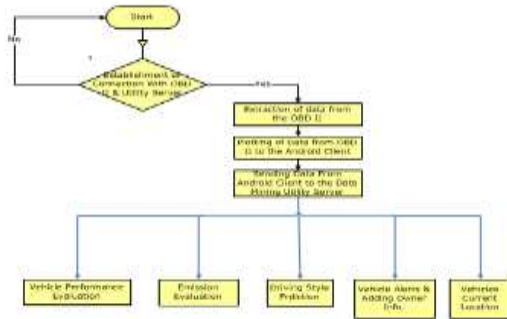


Fig 2: Flow of system

4. ALGORITHMS

1. k-means cluster algorithmic rule
2. Advanced coding commonplace

K-means cluster algorithmic rule

This algorithmic rule is employed for calculation of driving behavior by differentiating the driving force into clusters rash driving.

- Partitioning cluster Approach
 - A typical cluster analysis approach via iteratively partitioning coaching knowledge set to be told a partition of the given knowledge house
 - learning a partition on a knowledge set to provide many non-empty clusters (usually, the quantity of clusters given in advance)
 - in principle, optimum partition achieved via minimizing the total of square distance to its “representative object” in every cluster

$$E = \sum_{k=1}^K \sum_{x \in C_k} d^2(\mathbf{x}, \mathbf{m}_k)$$

e.g., Euclidean distance

$$d^2(\mathbf{x}, \mathbf{m}_k) = \sum_{n=1}^N (x_n - m_{kn})^2$$

Advanced Encryption Algorithm

- designed by Rijmen-Daemen in Belgium
- has 128/192/256 bit keys, 128 bit data
- an **iterative** rather than **Feistel** cipher
- processes data as block of 4 columns of 4 bytes
- operates on entire data block in every round

5. CONCLUSION

In this method we've established value economical thanks to keep an eagle eye on rash driving behavior of drivers and additionally diagnose vehicle condition simply. Drivers unwittingly exhibit these inefficient and unsafe driving behaviors in their everyday driving activity and technical details are required for analysis of Real Time automobile observation. This method can facilitate to cut back future unwanted incidences caused by rash driving

REFERENCES

- [1] Ruta, M., Scioscia, F., Gramegna, F., Di, E.: A Mobile Knowledge-Based System for On-Board Diagnostics and Car Driving Assistance. In: The Fourth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM2010), IARIA (2010)
- [2] Colucci, S., Di Noia, T., Pinto, A., Ragone, A., Ruta, M., Tinelli, E.: A non-monotonic approach to semantic matchmaking and request refinement in emarketplaces. International Journal of Electronic Commerce 12(2) (2007)
- [3] Lin, C., Li, C.C., Yang, S.H., Lin, S.H., Lin, C.Y.: Development of On-Line Diagnostics and Real Time Early Warning System for Vehicles. In: Sensors for Industry Conference, 2005. (2005)
- [4] Lin, C.E., Shiao, Y.S., Li, C.C., Yang, S.H., Lin, S.H., Lin, C.Y.: Real-Time Remote Onboard Diagnostics Using Embedded GPRS Surveillance Technology. Vehicular Technology, IEEE Transactions on 56(3) (2007)
- [5] 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)
- [6] Kargupta, H., Bhargava, R., Liu, K., Powers, M., Blair, P., Bushra, S., Dull, J., Sarkar, K., Klein, M., Vasa, M., Handy, D.: Vedas: A mobile and distributed data stream mining system for real-time vehicle monitoring. In Berry, M.W., Dayal, U., Kamath, C., Skillicorn, D.B., eds.: SDM, SIAM (2004)

- [7] Choi, S., Kim, J., Kwak, D., Angkititrakul, P., Hansen, J.: Analysis and Classification of Driver Behavior using In-Vehicle CAN-Bus Information. In: Biennial Workshop on DSP for In-Vehicle and Mobile Systems. (June 2007)
- [8] Quintero, M., Oñate Lopez, J., Rua, J., et al.: Intelligent erratic driving diagnosis based on artificial neural networks. In: ANDESCON 2010, IEEE (2010)
- [9] Ruta, M., Di Noia, T., Di Sciascio, E., Scioscia, F.: Abduction and Contraction for Semantic-based Mobile Dating in P2P Environments. In: Proceedings of 2008 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology, IEEE (2008)