Machine Learning based Vehicle Performance Analyzer

Team leader – SELVA RAMYA P

Team members – INDIRA R

SIVASANKARI M

SONABENITTA T

ARULAPPAN M

ABSTRACT

The monitoring of car performance, especially gas consumption, has so far been approached only very superficially. A typical fuel gauge, when closely monitored, shows an extremely non-linear relationship between needle movement and fuel consumption. Inaccuracies occur especially in the range of critical low fuel values of 5-10% or more. In the past, due to this limitation, some luxury cars had an audible and flashing light alarm function to indicate a low fuel condition. These systems, which add to the existing fuel level, have no more accuracy than the fuel level monitor alone.

In recent years, with the availability of computer techniques and reliable and less expensive computer equipment, a number of systems have been developed to provide somewhat more accurate information about vehicle performance.

LITERATURE SURVEY

- Singh D, Singh M., "Internet of Vehicles for Smart and Safe Driving", International Conference on Connected Vehicles and Expo (ICCVE), Shenzhen, 19 -23 Oct.,2015. (This paper has discussed about smart transportation services in cloud (Cloud-STS) for safety and convenience. STS provide driver centric board services in the cloud networks. STS composed of Vehicle to WiFi networks (V to Wi-Fi), Vehicle to Cloud Network (V to CN), Vehicle to Vehicle (V to V), and Cloud Network to service provider (CN to SP). The idea is to utilize the (Wi-Fi enabled) Smart Highways and 3D camera enabled dash board navigation device to enhance accident prevention / monitoring and control.)

- Zhang, Y., Lin, W., and Chin, Y., "Data -Driven Driving Skill Characterization: Algorithm Comparison and Decision Fusion," SAE Technical Paper 2009 -01 -1286, 2009, https://doi.org/10.4271/2009 -01 -1286.Azevedo, C. L Cardoso. (By adapting vehicle control systems to the skill level of the driver, the overall vehicle active safety provided to the driver can be further enhanced for the existing active vehicle controls, such as ABS, Traction Control, Vehicle Stability Enhancement Systems. As a follow-up to the feasibility study in, this paper provides some recent results on data-driven driving skill characterization. In particular, the paper presents an enhancement of discriminant features, the comparison of three different learning algorithms for recognizer design, and the performance enhancement with decision fusion. The paper concludes with the discussions of the experimental results and some of the future work.

- J. E. Meseguer, C. T. Calafate, J. C. Cano and P. Manzoni, "Driving Styles: A smartphone application to assess driver behaviour," 2013 IEEE Symposium on Computers and Communications (ISCC), Split, 2013, pp.000535 -000540. doi:10.1109/ISCC.2013.6755001. (The Driving Styles architecture integrates both data mining techniques and neural networks 2 to generate a classification of driving styles by analyzing the driver behavior along each route. In particular, based on parameters such as speed, acceleration, and revolutions per minute of the engine (rpm), we have implemented a neural network-based algorithm that is able to characterize the type of road on which the vehicle is moving, as well as the degree of aggressiveness of each driver. The final goal is to assist drivers at correcting the bad habits in their driving behaviour, while offering helpful tips to improve fuel economy. In this work we take advantage of two key-points: the evolution of mobile terminals and the availability of a standard interface to access car data).

- Kenneth L. Clarkson. 1985. Algorithms for Closest -Point Problems (Computational Geometry). Ph.D. Dissertation. Stanford University, Palo Alto, CA. UMI Order Number: AAT 8506171. (This dissertation reports a variety of new algorithms for solving closest-point problems. The input to these algorithms is a set or sets of points in d-dimensional space, with an associated L (, p) metric. The problems considered are: (1) The all nearest neighbours' problem. For point set A, find the nearest neighbours in A of each point in A.
  (2) The nearest foreign neighbour problem. For point sets A and B, find the closest point in B to each point in A. (3) The geometric minimum spanning tree problem).

- Goszczynska H., Kowalczyk L., Kuraszkiewicz B. (2014) Correlation Matrices as a ool to Analyze the Variability of EEG Maps. In: Piętka E., Kawa J., Wieclawek W. (eds) Information Technologies in Biomedicine, Volume 4. Advances in Intelligent Systems and Computing, vol 284. Springer. (The aim of this paper is to present the selected
  examples of possible applications of image of correlation coefficients matrix of EEG map series in the analysis of variation of the topography of the isopotential areas in EEG maps, and thus in the assessment of stationarity, spatio-temporal variability and trends of changes of bioelectric activity of the brain. The image of correlation coefficients matrix shows similarity of all pairs of maps in a series. The choice of segmentation threshold of characteristic areas in images of the correlation coefficients matrix of EEG map series corresponding to the sequence similarity relationships in a series of maps was based on the results of research conducted on test series).