MACHINE LEARNING BASED VEHICLE PERFORMANCE ANALYZER

MEMBERS :

Afsal S (Team Leader)

Hariprasath M (Team Member)

KrishnaMoorthy M (Team Member)

Kevin S (Team Member)

ABSTRACT

This paper identifies a necessity to evaluate the meta features of vehicles which could be helpful in improving the vehicle driver's skill to prevent accidents and also evaluate the change in the quality of cars over passing time. This paper does an analysis of the vehicle data using supervised learning based linear regression model that is used as an estimator for Driver's safety Metrics and Economic Driving Metrics. The data collected was obtained from fifteen different drivers over a span of one month which accumulated over 15000 data points. And the metrics that we devised have potential application in automotive technology analysis for developing an advanced intelligent vehicles. And, we have presented a system for performing the real-time experiment based on the On-Board-Diagnosis version II (OBD-II) scanner data. Finally, we have analyzed and presented the parameter accuracy over 80% for the driver's safety solution in real-world scenario.

LITERATURE SURVEY

Title	Author Name	Year of Paper	Methodology
Development of heavy-duty vehicle fuel consumption standards.	Zheng T	2013	Three main detection algorithms;Gaussian Mixture Model(GMM), Histogram of Gradients (HoG), and Adaptive motion Histograms based vehicle detection are implemented and evaluated for performance under varying illumination, traffic density and occlusion conditions.
SmartWay Carrier Performance Rankings.	Raksit Thitipatanapongetal	2014	The samples of drivers were different driving behavior affecting fuel consumption for 30% between the worse and the best. From the analysis, the rate of fuel consumption and acceleration significantly related.
Reduction and testing of GHG emissions from heavy-duty vehicles.	Hausberger,S.,A. Kies, et al.	2012	The relevant data for this analysis was taken from the public source, Kaggle which is the data collected from the OBDof the car and models are built using techniques like MultipleLinear Regression, XGBoost, Support Vector Machine and Artificial Neural Network and their performance is compared to discover the first-rate technique in predicting the fuel.
Effect of weight and roadway grade on the fuel economy of class-8 freight trucks.	Franzese, O., and D. Davidson	2011	A ride comfort analysis was performed using MATLAB tostudy the passenger's ride comfort in all three-shuttledesigns. Since modern suspension systems are being integrated with an active control suspension system, an active control suspension model was developed in order to observe the benefits ofincorporating this technology into our new design.

SUMMARY

This study reviewed and summarized available data for commercial vehicle sales as well as real-world fuel consumption values for tractor-trailers in the U.S., EU and China. Together, these key markets constitute more than 70% of HDV sales worldwide. Looking at the breakdown of HDV fuel consumption in each of the three regions, tractor-trailers represent the largest (or nearly the largest in the case of China) share of fuel use and GHG emissions. As such, we chose this segment of HDVs as the initial focus of our ongoing effort to better understand how blossoming fuel efficiency regulations for heavy-duty trucks and buses in various markets around the world are impacting technology penetration and real-world fuel efficiency performance. Fuel consumption data for full vehicles generally fall into one of the following four categories: national or regional data, aggregate data across a number of fleets, road test data for individual vehicles, and chassis dynamometer data. For this study, we had access to all four types of data, although the types of data available for each region varied widely. Overall, despite there being a general scarcity of data for real-world fuel consumption of tractor-trailers, we found the largest number of publicly available sources for the U.S., followed by the EU, with China having very few sources to reference other than chassis dynamometer results.