PROJECT PROPOSAL

Department of Information Technology

Project Idea 1

Title: Remote Engine Health Monitoring and Predictive Maintainance

Brief Description:

The diesel engine are most common type of engine used in various industries, this engines sometimes face malfunctioning in Ignition System, Fuel System, Exhaust System, Cooling System. Maintenance strategy being used in vehicle industry is normally reactive that results in reduction of lifetime of vehicle and also loss of money. Predictive maintenance is required on this stage to overcome these issues. The proposed system will make the predictive maintenance possible with the help of Machine Learning algorithm such as SVM, Random Forest or Decision Tree depending on the precision provided by each. Every Vehicle have ECU in it which collect the data from different systems in car for fault detection, this data can be collected using OBD2 scanner device with a bluetooth for transmission of data to the mobile phones, the data will be then store on a cloud platform.

On the cloud the Machine Learning model will be deployed and the real time working conditions and fault codes of the engine will be used for the analysis and processing of these Big data to predict the fault in the vehicle before it actually takes place, this prediction will be done on the basis of real time data collected from the car's ECU. The Fault prediction then will be displayed on a web portal through which it can be easily accessed by the Service center, Car retailer, Insurance Company. Driver will also be notify about fault that can occur, so on the basis of which driver can take precautions. Analysis of history running data, working condition, common mode failure, action data of the driver, recorder of maintenance and repair, geographic position and so on. All this information can be used to predict the engine health and give suggestion and precaution to the customer. As a result, it can deduce fault and accident, ensure the vehicle running more safety.

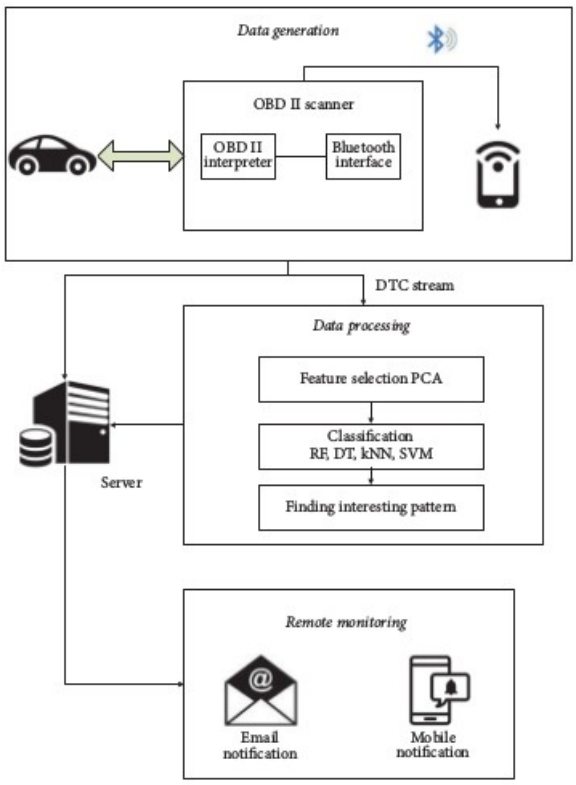
Technology Integration:

- OBD2 Scanner
- AWS / OpenStack
- Machine Learning(SVM,K-NN,RF)
- Python

Scope of The Project:

With the increasing trend of smart phones and wireless communication, it has become feasible to use these technologies for real time solutions. Despite limited resources, these technologies are being used along with machine learning approaches to solve big problems in automotive industry. A novel vehicle monitoring and fault predicting system is presented in this paper. Four classifiers including Decision Tree, SVM, RF, and K-NN can been used for fault prediction. Four main systems of vehicles have been considered. The main objective of the proposed system is to reduce the fault frequency of systems in vehicle.

Work Flow:



Literature Base Paper:

https://ieeexplore.ieee.org/document/7474414
A Remote Engine Health Management System Based on Mobile Cloud Computing
Jian Xiong; Hong Gu
April, 2016

https://ieeexplore.ieee.org/document/7377695
Cloud-based driver monitoring and vehicle diagnostic with OBD2 telematics
Malintha Amarasinghe; Sasikala Kottegoda; Asiri Liyana Arachchi; Shashika Muramudalige; H. M. N. Dilum Bandara; Afkham Azeez.
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IoT Cloud Based Real Time Automobile Monitoring System
Ashwin Srinivasan
Sept, 2018

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