**Resale Price Prediction in the Used Car Market**

Stefan Voß et al have proposed both theoretical and practical solutions on solving the problem of gauging used car prices in the European car market due to the several challenges imposed on the second-hand market(problem of overcapacity, increasing competition from Asian car manufacturers and the upcoming production of eco-friendly cars).

Their published literature has used real time sales from German car manufacturers to draw up an empirical analysis on the power of the other prediction methods and modelling strategies in the automotive industry. The publication also gives a better internal forecasting/prediction by exploring the predictive value of private information that is available to used car vendors. This helps the accuracy of predicting a better value for a used car from an economic perspective as internal insights can broaden the perspective of the examination. This study also tells us about the specificity of resale price forecasting models and the different levels of granularity they are built upon.

In summary the results showed that the predicting models that employed linear regression predict significantly less accurately compared to advanced methods like RF and ES as these advanced methods were better in extracting useful predictive information from Private information and are robust to high dimensionality.

**Prediction of Resale Value of the Car Using Linear Regression Algorithm**

Kiran S proposed a solution for forecasting and predicting used car resale values in the current car market using linear regression. The proposed paper maps relations between key attributes and many other significant relationships by establishing correlations among said attributes which help in plotting regression model for an accurate prediction.

Linear regression is a machine learning algorithm based on supervised learning and models a target prediction value based on independent variables. Different regression models differ based on the kind of relationship between dependent and independent variables. they are considering and the number of independent variables being used.

The Linear Regression model for prediction of resale value of the car provided an accuracy of 90% . Linear Regression Model gave an error of 10%. Linear Regression model is better suited for prediction of target attribute that is car price. Further this work can be implemented using different machine learning algorithms and approaches in order to get higher accuracy rate and lower error percentage.

**Car Price Prediction using Machine Learning Techniques**

Enis Gegic et al proposed techniques on predicting price of a car in the current economy where the number of cars being registered for personal use is increasing at a substantial rate, This adds more significance to predicting care prices. This publication covers methods and techniques on predicting prices in the Boznia and Herzigovina region. This problem of predicting is very hard as we have to take into many factors like fuel price, fuel type, brand value and the environment of manufacturing.

This paper covers a general ground of techniques for predicting car prices by following normal conventional pre processing and cleaning data methods then moving on to a random forest classifier to split car prices into sub groups for easing the process of predicting future prices. This classified data is then fed into SVMs and Artificial Neural networks to get an apt prediction of future prices.

In summary the paper states that however challenging it may be to predict futre prices of a car based on the overwhelming amount of factors in the environment the most important step for accurate prediction is the preprocessing of the data to feed an accurate and noiseless data for the machine learning algorithms to give an accurate read of forecasting of the prices.

**Used Cars Price Prediction using Supervised Learning Techniques**

The trade-in vehicle market is a rising one which has multiplied its worth in a few short years. Online trading portals such as CarDheko, Quikr, Carwale, Cars24, and numerous others has worked with the requirement for both the client and the merchant to be better educated about the patterns that decide the worth of the pre-owned vehicle. In this paper Venkatasubbu et. Al. have used several Machine Learning techniques such as Lasso Regression, Multiple Regression and Regression Trees to predict the sale price of a vehicle. The models were built on the data gathered from 2005 Focal Edition of Kelly Blue Book and had 804 records of 2005 GM vehicles.

The 3 trained models were used to predict the price of the test data, which contained 241 records. The error rate in multiple regression (3.468%) was smaller than the error rate in Regression tree (3.512%) which was lesser than the error rate in Lasso Regression (3.581%). They further iterated process of selection records to get the average error rates of the three models.

Using One-way Analysis Of Variance (ANOVA) they verified whether the error rates of these models differed significantly from each other. They inferred that the mean error rates of lasso regression models and multiple regression models are not significantly different, but the mean error rate of regression trees are higher and significantly different from the other two. To get even more accurate models, they concluded that more advanced machine learning algorithms such as random forests, an ensemble learning algorithm which creates multiple decision/regression trees can be chosen.

**Predicting the Price of Used Cars using Machine Learning Techniques**

In this paper, Pudaruth et. Al. investigate the application of supervised machine learning techniques to predict the price of used cars in Mauritius. According to data obtained from the National Transport Authority, the number of cars registered between 2003 and 2013 has witnessed a spectacular increase of 234%. The data used was found in daily newspapers, all the data was collected in less than one month interval as time itself could have an appreciable impact on the price of cars. only the three of the most popular makes in Mauritius, i.e. Toyota, Nissan and Honda was used. The final database contained only 97 records: Toyota (47), Nissan (38) and Honda (12).

Different techniques like multiple linear regression analysis, k-nearest neighbours, naïve bayes and decision trees have been used to make the predictions. The mean error with linear regression was about Rs51, 000 while for kNN it was about Rs27, 000 for Nissan cars and about Rs45, 000 for Toyota cars. J48 and NaiveBayes accuracy dangled between 60-70% for different combinations of parameters. The main weakness of decision trees and naïve bayes is their inability to handle output classes with numeric values. The main limitation of this study is the low number of records that have been used. As future work, they intend to collect more data and to use more advanced techniques like artificial neural networks, fuzzy logic and genetic algorithms to predict car prices.