

# Car Resale value Prediction

## Paper 1- Prediction of Prices for Used Car by Using Regression Models

In the first existing survey Ref - N. Monburinon, P. Chertchom, T. Kaewkiriya, S. Rungpheung, S. Buya and P. Boonpou, "Prediction of prices for used car by using regression models," 2018 5th International Conference on Business and Industrial Research (ICBIR), 2018, pp. 115-119, doi: 10.1109/ICBIR.2018.8391177.

For this research, they conducted a comparative study on performance of regression based on supervised machine learning models. Each model is trained using data of used car market collected from German e-commerce website. As a result, gradient boosted regression trees gives the best performance with mean absolute error (MSE) = 0.28. . Followed by random forest regression with MSE = 0.35 and multiple linear regression with MSE = 0.55 respectively.

## Paper 2 - A New Model for Residual Value Prediction of the Used Car Based on BP Neural Network and Nonlinear Curve Fit

In the second existing survey Ref -S. Gongqi, W. Yansong and Z. Qiang, "New Model for Residual Value Prediction of the Used Car Based on BP Neural Network and Nonlinear Curve Fit," 2011 Third International Conference on Measuring Technology and Mechatronics Automation, 2011, pp. 682-685, doi: 10.1109/ICMTMA.2011.455.

A new model for predicting the residual value of the private used car with various conditions, such as manufacturer, mileage, time of life, etc., was developed in this paper. A comprehensive method combined by the BP neural network and nonlinear curve fit was introduced for optimizing the model due to its flexible nonlinearity. Firstly, some distribution curves of residual value of the used cars were analyzed in time domain. Then, the BP neural network (NN) was established and used to extract the feature of the distribution curves in various conditions. A set of schemed data was used to train the NN and reached the training goal. Finally, the schemed data as inputs and the NN outputs were organized for nonlinear curve fit. Conclusion was drawn that the

newly proposed model is feasible and accurate for residual value prediction of the used cars with various conditions.

## Paper 3 - Price Prediction of Used Cars Using Machine Learning

C. Jin, "Price Prediction of Used Cars Using Machine Learning," 2021 IEEE International Conference on Emergency Science and Information Technology (ICESIT), 2021, pp. 223-230, doi: 10.1109/ICESIT53460.2021.9696839.

This paper aims to build a model to predict used cars' reasonable prices based on multiple aspects, including vehicle mileage, year of manufacturing, fuel consumption, transmission, road tax, fuel type, and engine size. This model can benefit sellers, buyers, and car manufacturers in the used cars market. Upon completion, it can output a relatively accurate price prediction based on the information that users input. The model building process involves machine learning and data science. The dataset used was scraped from listings of used cars. Various regression methods, including linear regression, polynomial regression, support vector regression, decision tree regression, and random forest regression, were applied in the research to achieve the highest accuracy. Before the actual start of model-building, this project visualized the data to understand the dataset better. The dataset was divided and modified to fit the regression, thus ensure the performance of the regression. To evaluate the performance of each regression, R-square was calculated. Among all regressions in this project, random forest achieved the highest R-square of 0.90416. Compared to previous research, the resulting model includes more aspects of used cars while also having a higher prediction accuracy.