THESIS ABSTRACT

An Application of Machine Learning Techniques to Predict Automotive Fuel Consumption

by
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In this work a preliminary study is carried out to understand the potential and limitations of a predictive Machine Learning model developed to predict automotive fuel consumption, without the need for road tests. The data used were collected by a car company, using sensors placed on vehicles that have made common road journeys over the years.

After an initial theoretical introduction, the variables used for the development of the model are explained, highlighting the difference between those that depend on the driving style and the purely technical ones. The variable of interest are the kilometers travelled per liter (km/l).

The central piece of this paper explains how the best model is chosen, based on the results of various algorithms. More attention is given to complex models, such as Artificial Neural Networks and Random Forest. All of them are developed using the Python programming language, and particular importance is given to the choice of the hyperparameters of each one.

The results of each model are evaluated using metrics typical of regression problems, like mean absolute error (MAE) and root mean squared error (RMSE). At the end some considerations on the effectiveness and solidity of the model.