

Predictive maintenance in Construction Author: Dena Markudova



Scenario and motivation

Tierra S.P.A monitors construction vehicles through on-board devices and a CAN-bus network. Vehicle status data, like fuel level, engine ON/OFF, oil level etc. is collected and sent to the cloud regularly.

Methodology

PAST





These vehicles need maintenance operations. We develop algorithms for predictive maintenance using Machine learning techniques.



We use regression algorithms, such as Support Vector Regression and Random Forest Regression to predict the future usage or the days left to maintenance.

Results

Prediction of the next-day usage hours for a vehicle:

Problem Statement

Given the usage pattern of a vehicle in the past days: **Ex.1** Predict the usage hours of the vehicle on the next day

Ex. 2 predict the exact number of days left to maintenance

Data Characterization





Prediction of days left to maintenance:







Construction vehicles come in various types and models that are used differently. This makes it difficult to create a «one fits all» model.

Conclusions and future work

It is difficult to predict the exact usage hours of a vehicle in the future (average error 29% over ~60 vehicles), but it is easier to predict the exact number of days left to maintenance (median error 2.4 days when close to maintenance date, over ~3000 vehicles)

As future work we imagine to cluster vehicles into groups according to their usage pattern and working states.