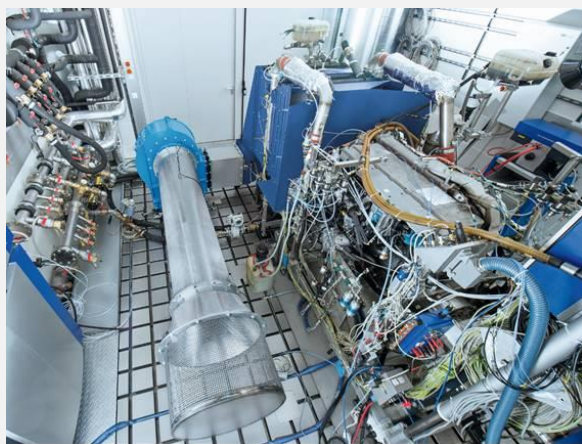


# DATA SCIENCHE CHALLENGE

## TASK ANNOUNCEMENT

### CONTEXT

Combustion engines in the automotive sector consist of multiple components, which performance indicators can be measured by special sensors either in a testing or a field scenario. Through the application of data mining techniques on time series data, collected by these sensors, it is possible to get insights into the condition of an engine. These methods can be used for predictive analytics to avoid unplanned machine failures or to detect abnormal behavior.



AVL List GmbH is the world's largest independent company for development, simulation and testing technology of powertrains (hybrid, combustion engines, transmission, electric drive, batteries and software) for passenger cars, trucks and large engines.

AVL is ecologically responsible to meet the regulations of exhaust gas. For this year's data science challenge, time series data of vehicle road trips is provided. The task is to forecast the critical indicator for exhaust Nitrogen Oxide (NOx) content of emission. The prediction should be achieved by analyzing the measurement of several sensors (e.g. cooling water temperature, torque, rotation speed, ...).

### TIME FRAME & PROCESS

Our five datasets for training are included in the first file *train.zip*. Each file contains approx. 10 hours of road trip data of the same vehicle. The datasets have been recorded from various channels in a 1Hz frequency. This, in turn, means that one row in the files features measurements of each sensor in a one second sample rate.

The second file *eval.zip* contains one other dataset, but the values for the channel "NOx-EO" are missing. Your challenge is to estimate the missing values by a model you trained with the training set. To measure the performance you achieved the mean absolute error of each of your calculated values will be evaluated. For more detailed channel descriptions and explanations on how to submit your solution, please read the file *readme.txt*.

Until October 29, 2018, 23:55 MEZ (UTC+1) you can submit your final solution by returning *eval.txt* including your predicted values for "Nox-EO". Please submit your answers via e-mail ([dsc@know-center.at](mailto:dsc@know-center.at)). The results will be ranked based on the mean average error. The 5 top participants will be asked to provide their source code and demonstrate their solution during a live session with the jury and describe their approach, applied methods and tools. We strongly encourage publishing your source code in a public repository (github, zenodo, etc.). After verifying the results, we will provide you with the full dataset and announce the winners.

Best of luck to you and happy number-crunching!

