

ML-based Predictive Maintenance of the Turbine of a Jet Engine

Leveraging ML algorithms and data insights for predictive maintenance through RUL forecasting of the turbine of a jet engine.

INDUSTRIAL DATA ANALYTICS

The process of collecting, analyzing and using plant data to harness the hidden value. Tools like e-DAP are capable of modelling a physical phenomenon on the basis of data collected over time. The insight gained helps improve operational efficiency, optimize process, and plan maintenance ahead of time.

SITUATION & CHALLENGE

- The challenge is to monitor in time the asset's health before the next fault to occur.
- The idea is to be capable to predict the maintenance of the turbine through the simulation of its Remaining Useful Life (RUL).

SERVICE & APPROACH

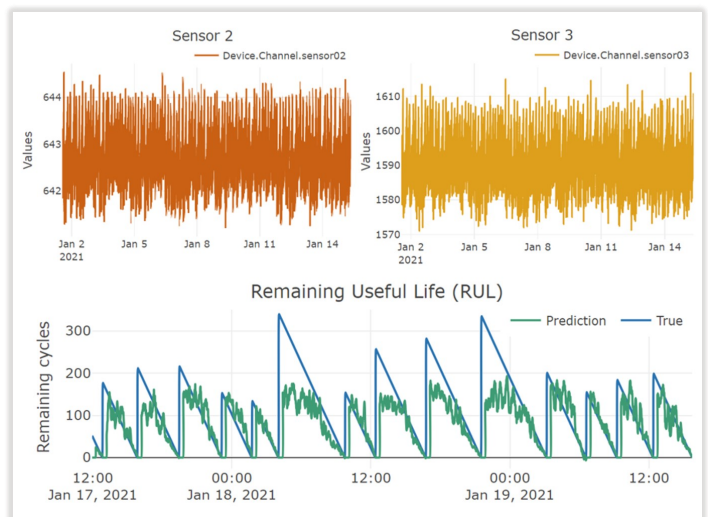
- Legacy data was collected, ingested, and engineered (feature selection, windowing, PCA, etc.).
- Selected ML algorithms targeted the Remaining Useful Life (RUL) for predictive modeling.
- Leveraging real-time sensor data, the model is able to predict the RUL and determine turbine maintenance needs, achieving excellent accuracy.
- An online workflow was integrated into e-DAP, embedding the data-model and associated KPIs.
- The platform was used to infer RUL and KPIs under future conditions.

E-DAP: the *end-to-end* data platform

A cloud-hosted infrastructure for the treatment of plant data: from IoT sensing, through engineering, dashboarding, ML/AI, digital twinning, to insight

IMPACT & ADDED VALUE

- The client now has on-line business intelligence tool, for predicting and monitoring the asset's health under defined KPIs.
- The client can infer possible failure cases using real time data as input to the asset's digital twin. Next step is to connect the IOT to e-DAP Edge.



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