Fraunhofer
ITWM

FRAUNHOFER INSTITUTE FOR INDUSTRIAL MATHEMATICS ITWM



PREDICTIVE MAINTENANCE FOR OPTIMIZING EQUIPMENT EFFECTIVENESS

Condition Monitoring

The optimization of equipment effectiveness mainly is based on two measures:

- Minimizing downtime
- Maximizing availability

Condition monitoring of equipment detects critical events and conditions with highwear potential. Events and faults are classified and evaluated.

Critical events or adverse operating states can be eliminated immediately by rapid reactions in order to avert cost-intensive consequential damage.

Downtimes are reduced because service technicians, spare parts and logistics can be made available in a targeted manner through appropriate diagnostics.

Predictive Maintenance

Reactive maintenance is difficult to plan due to spontaneous errors. Longer maintenance times are the result. Risks of failure are reduced by regular maintenance intervals. However, this is at the expense of the equipment's productive operating time. Based on empirical value gained in condition monitoring, predictive maintenance estimates risks of unwanted operating conditions and events. These predictions enable demand-oriented planning of service and maintenance activities. They are created for both, individual equipments as well as equipment parks. Ideally, predictive maintenance maximizes equipment availability and provides early information for targeted maintenance actions.

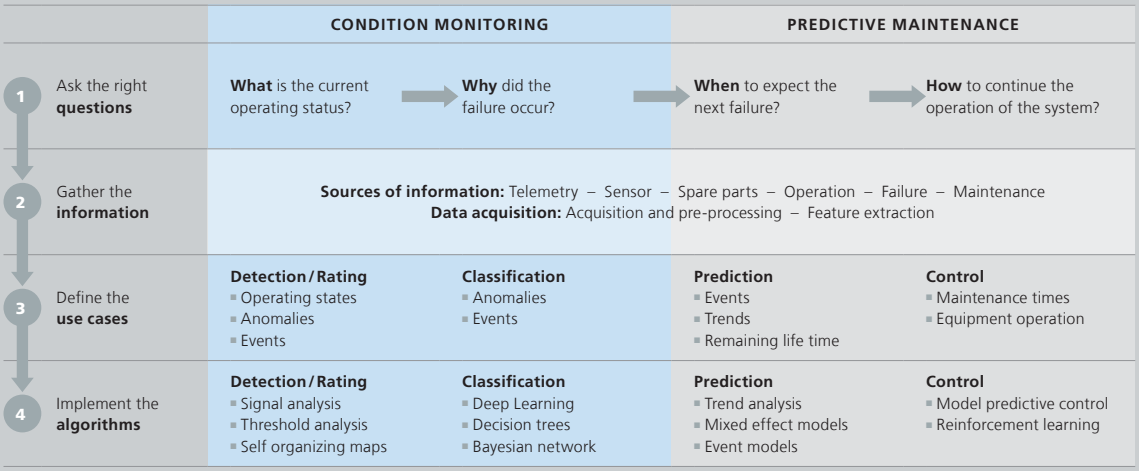
Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM

Fraunhofer-Platz 1
67663 Kaiserslautern
Germany

Contact
Dr. Benjamin Adrian
Systemanalysis, Prognosis and Control
Phone +49 631 31600-4943
benjamin.adrian@itwm.fraunhofer.de

www.itwm.fraunhofer.de/en/pm

sys_flyer_Predictive_Maintenance_DE-EN



Our services

The department System Analysis, Prognosis and Control supports you in optimizing the effectiveness of your equipment step by step. We support you, designing a solution-oriented condition monitoring and predictive maintenance systems. We analyze your existing knowledge and determine the information required by your application. Furthermore, we identify, develop and integrate machine-learning and deep-learning algorithms tailored for your data and information system. Needless to say, implemented solutions can be integrated into common IOT platforms.

CONDITION MONITORING

- System modeling and simulation with digital twins
- Selection and placement of sensors
- Construction of virtual sensors
- Identification and rating of operating states
- Classification of failures

PREDICTIVE MAINTENANCE

- Trend analysis, model-based prognosis of failures and critical events
- Computation of remaining useful life time
- Generation of automatic reports and dashboards
- Predictive control for efficient equipment utilization

Advantages

With the help of our experience, you can upgrade your equipment with condition monitoring. You combine the collected telemetry, service and maintenance information to estimate appropriate models and extend your service with predictive maintenance:

- Detect events, anomalies or failures
- Identify causes of unplanned failures or errors
- Plan with reliable prognosis of the remaining useful life of equipment
- Maximize usage time
- Minimize maintenance time through early planning of upcoming maintenance actions

Additional informationen: www.itwm.fraunhofer.de/en/pm