

PRESSE RELEASE

When the motor sounds funny

Experienced machinists hear faults before they become acute. The Fraunhofer Institute for Large Structures in Production engineering IGP is presenting a holistic method for monitoring large engines at the Hannover Messe. Failures of main engines on large ships, for example, are primarily expensive due to spare parts, labor and delays. In the research project "Acoustic sensor network with real-time data evaluation" - AKKUT for short - solutions are being developed within three EU-funded research projects to detect faults in ship engines in good time before critical failures occur in the future.

This includes an intelligent sensor network and fault location. Systems available on the market monitor individual critical points of the engine to detect local deterioration. In the ASEDA project (Acoustic Sensor Network with Real-Time Data Analysis), modular sensors with integrated signal processing are being developed in cooperation with the company ds automation. Preprocessing and detection of machine defects can take place directly on the embedded system. Interconnected and synchronized in a sensor network, localization of defect noise and thus global instead of local evaluation becomes possible.

Another project deals with pattern recognition with automated training. Together with the University of Rostock and S.K.M. Informatik GmbH, the automated evaluation of data from sensor networks is being implemented. Up to now, a manual definition of discrete features in the sensor signals has been common practice in order to classify data based on them. By using new algorithms for signal evaluation, the classification can be automated. Deviations from the normal state indicate, for example, an imbalance or wear. This makes it possible to detect acoustic anomalies at an early stage, before they become visible to humans.

In cooperation with Logic Way GmbH, a cloud-capable service platform called "IDaS-Sensor-Services" is being developed, which on the one hand secures the measurement data and at the same time has capacities for more complex long-term analyses. The AKKUT/E project - where the E stands for Edge - provides interfaces between the individual subsystems and the user. An intuitive and feedback-driven interface on mobile devices ensures easy usability of the system. In addition, a long-term analysis shows trends within the measurement results. The combination of service-oriented architecture and suitable virtualization creates the basis for service availability across company boundaries and extreme scalability.

Redaktion

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Together, a digital twin is created. Through the retrofit, the combination of centralized and decentralized evaluation with the inclusion of human-collected data, operating states can be derived. The corresponding reaction then takes place in the form of maintenance and repair services. The combination of service-oriented architecture and suitable virtualization creates the basis for the availability of services across company boundaries and extreme scalability.

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