



Energy-SmartOps

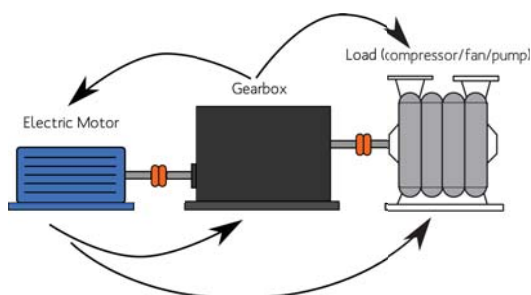
Integrated Control and Operation of Process, Rotating Machinery and Electrical Equipment

Multi-Sensor Data Fusion for Condition Monitoring.

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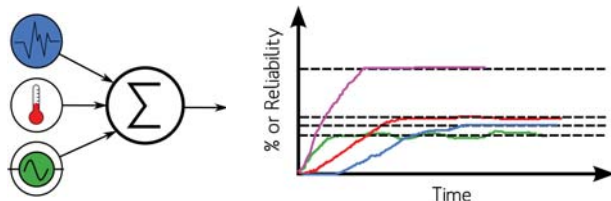
My Project In SmartOps

This specific Work-Package is related with electro-machinery, but due to the inherent interactions of Electric Motors and the driven machines, we could include also Turbo-machinery and Gearboxes.



Problem Statement

Condition Monitoring of Rotating Machinery is normally performed by analyzing the vibrations, the currents and/or the temperature signals. The signals are analyzed independently in order to assess the health of the machine.



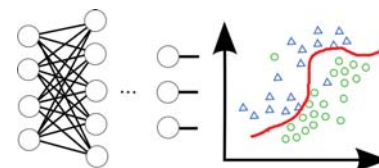
But what if we „fuse” all the signals in order to achieve a more refined overall health status?

Methodology

1. Literature Review and Intellectual Property (IP) status of the topic.
2. Where can the improvement be achieved?
3. How can the improvement be implemented?
4. Implementation.
5. Testing and Validation.

Results

Multi-Sensor Data Fusion has been conducted mainly by means of Neural Networks and Bayesian Inference methods.



-Gearboxes:
Vibrations-Debris Analysis

-Motors:
Currents and Vibration Signals.

Vibration signals recorded from different Locations.

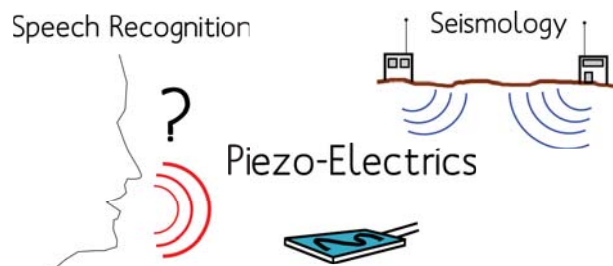
Conclusions

-Multi Sensor Data Fusion has been used extensively in military applications, and commercial applications start to be consolidated (robotics, image recognition, distributed systems).

-Despite the several applications of the sensor fusion methods, Condition Monitoring in particular, still has gaps that could be exploited.

Future Work

Future research shall be focused on the possibility to conduct Data Fusion of traditional methods and disruptive methods for Condition Monitoring.



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