

Automated online condition monitoring for rotating machinery

03 December 2015 - Programme

8:00 – 8:45	Registration
8:45 – 9:15	<p>Welcome and introduction to Mechatronics4.0 VIS-traject</p> <p>Opportunity to make that research you always wanted but never could</p> <p>The Mechatronics4.0 project aims to help Flemish companies to realize the Industry 4.0-philosophy: by integration of low-cost technology such as MEMS sensors, ICT applications, open source control platforms, etc., create a new generation of intelligent machines and products with large degree of autonomy. Automated condition monitoring will be a key feature of this next generation of machines, and is the focus of this Mechatronics4.0 Master Class.</p> <p><i>dr.ir. Pieter Beyl, Program Manager Mechatronics, Sirris</i></p>
9:15 – 10:00	<p>Condition monitoring, what is in it for me?</p> <p>Condition monitoring enables monitoring of the health of machines, their components and processes by measuring physical properties such as vibrations, sound and electrical signals. As such, wear out and defects can be detected in time. In addition, condition monitoring systems result in better insight in failures and allow optimization of the maintenance policy.</p> <p>This presentation gives an introduction to condition monitoring systems and illustrates their added value through concrete industrial use cases.</p> <p><i>dr. Andrei Bartic, Program Manager Smart Monitoring Systems, Flanders Make.</i></p>
10:00 – 10:30	<p>Challenges in condition monitoring of windmill gearboxes</p> <p>High reliability and minimal the downtime are very important requirements for windmill gearboxes. Online condition monitoring is a key enabler to achieve this. This presentation discusses some challenges from a practitioners point of view. Some aspects that will be addressed are: how to come up with accurate prediction of the lifetime based on real loads?; how to determine the type and severity of a defect?; which type of sensor can be used for fault diagnosis and how to integrate them?</p> <p><i>dr. ir. Kris Smolders, Manager Structural Component Design and Testing, ZFWind</i></p>
10:30 – 10:50	Coffee break
10:50 – 11:20	<p>From a vibration-based diagnostic systems for gear wheel faults towards automated, low-cost, online, vibration-based condition monitoring for gear boxes</p> <p>The way towards fully autonomous vehicles and machinery passes through automated condition monitoring. Currently, fault diagnostics involves off-line expert interpretation that is a hard limitation to fully exploiting the knowledge provided by condition monitoring. Flanders Make will present its vision on development of cost-effective, customizable, fully automated condition monitoring systems.</p> <p><i>dr. ir. Steven Devos, Project Manager, Flanders Make</i></p>

11:50 – 12:20	<p>On-board anomaly detection</p> <p>Growing complexity of industrial systems make it more and more difficult to detect system anomalies. While off-line techniques can localize permanent failures, they fail to detect the intermittent anomalies which occur when the system is operational. In this presentation we will illustrate an on-board anomaly detection solution that can detect both permanent failures and intermittent anomalies. Practical examples from industrial applications will be illustrated.</p> <p><i>dr.ir. Abdellatif Bey-Temsamani, Project Manager, Flanders Make.</i></p>
12:20 – 13:00	Lunch
13:00 – 13:30	<p>Demonstrations with live setups</p> <ul style="list-style-type: none"> Gearbox vibration diagnostics Electric motor fault detection Remaining useful lifetime prediction for wet clutches Connection defects detection
13:30 – 14:15	<p>Prediction and diagnosis of gearbox defects by analysis of vibrations</p> <p>Gearboxes are continuously vibrating during normal operation. Determining based on vibration measurements whether a defect occurred and diagnose which component failed is not trivial. During this presentation, a generically applicable method for automatically diagnosing gearboxes will be presented. The developed method provides a quick-start for developing a dedicated diagnostic system for your specific gearbox-application.</p> <p><i>dr.ir. Bovic Kilundu Y'Ebondo, Senior Research Engineer, Flanders Make</i></p>
14:15 – 15:05	Coffee break
15:05 – 16:00	<p>Fully automated, smart, vibration-based, online condition monitoring systems for bearing fault diagnostics</p> <p>Rolling-element bearing is one of the most critical components in rotating machinery. Nowadays, the semi-automated bearing fault diagnostic techniques gradually find their way to industry. However, the adaptation of the techniques requires an expert to tune the algorithms and to interpret the results. In this talk, an automated, online technique for bearing fault diagnostics is presented.</p> <p><i>dr.ir. Agusmian Partogi, Senior Research Engineer, Flanders Make</i></p>
16:00 - 16:30	<p>Low-cost sensing techniques for online, vibration-based condition monitoring</p> <p>Low cost sensors and acquisition systems are the key enablers for applying condition monitoring. In this presentation, Flanders Make shows its recent results in the usage of low-cost sensors, i.e. MEMS accelerometer and ultrasound microphones, for the realization of condition monitoring systems of rotating machinery. Some inherent limitations of the sensors, techniques to cope with these limitations and experimental results are discussed.</p> <p><i>dr.ir. Ted Ooijevaar, Research Engineer, Flanders Make</i></p>
16:30	Round Table discussion
17:00	Network drink