Predictive maintenance systems design.

Predictive maintenance is a maintenance strategy aiming at determining the “right” moment to trigger maintenance actions. The potential benefits of its implementation could be seen in safety increment, maintenance cost reduction, unforeseen breakdown elimination, productivity increment, etc. As modern technological systems demand high levels of safety and efficiency, predictive maintenance systems became an active field of research in academy and industry.

Despite the potential benefits, the deployment of new predictive maintenance systems remains limited; several challenges regarding their design remain unsolved. The lack of a systematic approach to develop new predictive maintenance system is the motivation for the current research project.

There exist several types of models and techniques used to perform diagnostics and prognostics. Determining what technique or techniques are best for a specific problem is not a trivial task, it relays on the specific purposes of the new predictive maintenance system and the available data, information and knowledge about the technical system.

The student will have the opportunity to work using artificial intelligence techniques (rule-based reasoning and case-based reasoning) to extract knowledge from existing predictive maintenance solutions found in literature. The objective is to obtain a comprehensive view on the engineers’ decisions during the development process to select a model type or a specific technique to address a diagnostic or prognostic task. If time permits, further research on the implementation of the approach would be performed with as aim to come to a demonstrator prototype.

Supervisor

The subject is proposed by Prof. Rob A. Vingerhoeds.

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