

Popular science summary of the PhD thesis

PhD student	Jesper Fink Andersen
Title of the PhD thesis	Maintenance optimization for multi-component systems using Markov decision processes
PhD school/Department	DTU Compute

Science summary

* Please give a short popular summary in Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof. The summary should be written for the general public interested in science and technology. Before the thesis defence, the summary is sent to DTU's Office for Communication and Media and to the media *Ingeniøren*:

In an automated world that is increasingly reliant on machines, the amount of resources needed to maintain all the expensive apparatus also increases. Traditionally, we uphold an operating piece of equipment by performing regular service and maintenance, in order to prevent it from breaking down. This can often lead to equipment being over-maintained. Recent developments of sensor technology enable us to continuously monitor the condition of in-service equipment. Statistical tools can then be used to predict deterioration and determine the need for maintenance work. This approach is known as condition-based maintenance. The goal is to keep costs low by reducing the frequency of maintenance tasks, only performing the necessary inspections and repairs. This is, however, a difficult scheduling problem, since predictions are always accompanied by uncertainty. It becomes even more difficult, if the condition of multiple machines must be taken into account simultaneously. The aim of this project is to develop the necessary mathematical models for scheduling condition-based maintenance activities, in order to strike a balance between the maintenance cost and the risk of equipment breaking down.



Please email the summary to the PhD secretary at the department