Seminar ‘Fleet-based analytics for data-driven operation and maintenance optimisation’ (13/12/2017)

Programme

13:00: Welcome coffee

13:30: Fleet-based analytics: what, why and why now?

13:40: Challenges and opportunities in fleet-based analytics – How data analytics for operational optimisation and maintenance can impact your company?

14:00: Academic keynote: Dr. Arno Knobbe, Leiden Institute of Advanced Computer Science (liacs)

14:30: Cognitive Discovery: How we use Machine Learning to extract knowledge from technical documents by Dr. Peter Staar, IBM Research – Zurich

“Machine learning (and in particular Deep learning) has made a significant impact in the scientific community. Knowledge Discovery and Data Mining (KDD) is an interdisciplinary area focusing upon methodologies for extracting useful knowledge from data. The ongoing rapid growth of online data due to the Internet and the widespread use of databases have created an immense need for KDD methodologies. The challenge of extracting knowledge from data draws upon research in statistics, databases, pattern recognition, machine learning, data visualisation, optimisation, and high-performance computing, to deliver advanced business intelligence and web discovery solutions.

In this talk, I will present how we are using these methods in the context of coupled models in order to extract knowledge from the exponentially growing amount of available data in industry. In addition to time series data I will focus on non-structured data and explain how we are using ML in order to ingest and understand complicated technical documents, extract knowledge out of these documents and eventually put this extracted knowledge into context using knowledge graphs. This approach is very general and allows us to build advanced systems, with which you can query the data encased in your documents in a natural way. We will demo this idea during the talk with a use-case in Material Science.”

15:00: Coffee break with tech booths of companies and demos/posters by the HYMOP partners

15:30: An overview of the current state-of-the-art in fleet-based analytics for data-driven operation and maintenance optimisation based on several real-world industrial use cases

- Semi-supervised anomaly detection with an application to resource usage by KU Leuven
  - How can anomaly detection help to identify deviating behaviour?
  - How can the lack of few labelled measurements be tackled by means of semi-supervised learning?
- How can active learning support the data scientist to ask the domain expert for feedback?

- **Mining Cohesive Patterns in Temporal Data by University of Antwerp**
  - What types of patterns can be discovered in temporal data?
  - How to measure the interestingness of patterns?
  - What are cohesive patterns and why are they useful?

- **Time series prediction, anomaly detection and data reduction applied to several use-cases by imec**
  - How to create extra value from captured data, using time-series data processed with machine learning techniques?
  - How can generic machine learning approaches create value in use cases originating from different applications domains?

- **Understanding and characterising the operational behaviour of a fleet of assets – Sirris**
  - How to characterise the operational behaviour of an individual machine in a data-driven way?
  - How to generalise this approach to account for the fleet context in which the machine is operating?
  - How to use this approach to identify irregular operating behaviour?

- **Vrije Universiteit Brussel – title to be announced**

16:30: Future directions

16:45: Networking reception with tech booths of companies and demos/posters by the HYMOP partners

18:00: End