

Research theme	Smart Industry, Industrie 4.0
Research title	Smart Industry at Apollo Tyres
Researcher	Rein Liefers
Research period	From November 2015 to August 2016
Company	Apollo Tyres
Supervisor	J.M. Jauregui Becker

Background

Smart Industry is a Dutch platform that focusses on supporting changes in the so called fourth industrial revolution, an era where the creation of cyber physical systems is a central theme. Apollo Tyres is a tyre development and manufacturing company interested in Smart Industry. They are interested in what this movement can mean for their production system.

Assignment

Finding opportunities related to Smart Industry at Apollo Tyres to improve the productivity. By creating a general overview and further zooming in on the subject, a detailed image of the opportunities is provided. To get hands-on experience, a test-case is performed at low level implementation. This information obtained during the test-case is translated back to more general requirements for implementation of Smart Industry at Apollo.

Results

One part of the thesis focused on creating predictive models to increase the productivity at Apollo Tyres, specifically at a continuous rubber extrusion machine. Machine learning algorithms were used to investigate the predictive capabilities of historical machine data. The machine learning algorithms worked well and are very powerful in prediction non-linear behaviour. However, the quality of the historical data proved to be of a poor quality. Therefore, it was not possible to make accurate predictions to improve the productivity of the extrusion machine. A recommendation was made to keep focusing on flexible production systems in order to keep flexible and be able to meet varying customer demands.

Personal experience

It was a challenging assignment from the start since the scope of Smart Industry is huge. Therefore, it took some time to make a proper selection on the area of focus. This made it difficult at the beginning to set up a research methodology. The diversity of the subject and the novelty of the test-case made it interesting to work on. I've gathered loads of new knowledge on a variety of subjects from machine learning algorithms to Smart Industry. Working at an external company is very interesting since you obtain much more practical experience and realize that real-life datasets are not as clean and perfect as academic assignments.