Machine learning algorithms and statistical approaches for modelling large-scale manufacturing domains

Predicting faults in Bosch's manufacturing and initial analysis for Seagate's production line

Caoimhe M. Carbery*[1,2], Roger Woods[1],
Adele H. Marshall[2]

[1] Electronic Computer Engineering Cluster (ECE), Queen's University Belfast
[2] Mathematical Sciences Research Centre (MSRC), Queen's University Belfast
*Email: ccarbery02@qub.ac.uk

Abstract: International manufacturing companies have highlighted the benefit they receive from early prediction and detection of failures to improve their product yield and reduce potential system faults. The abundance of data generated from the production lines in this industry is vast, thus imposing further difficulties with statistical analysis and machine learning algorithms[2].

Results will be presented for the Bosch manufacturing company which can be found in our paper which is to be presented at the IEEE International Conference of Industrial Technology (ICIT). Bayesian networks (BNs) were utilised to generate an interpretable network for diagnosing faults in the Bosch production line. The data was made available by Kaggle [1]. The focus on this approach was to create a mechanism for learning the BN structure of a large complex system, as structure learning without prior knowledge is often reserved for smaller data samples [3].

Initial analysis of another manufacturing domain will be presented along with background details surrounding the dataset. This will encourage discussion for future statistical models to be implemented.

References

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