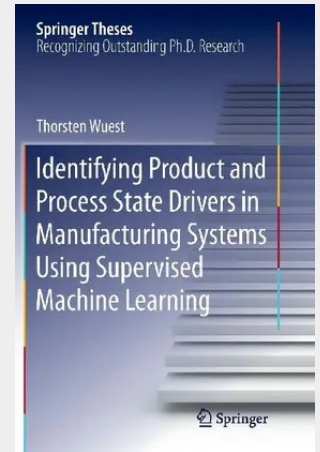


Identifying Product and Process State Drivers in Manufacturing Systems Using Supervised Machine Learning

The book reports on a novel approach for holistically identifying the relevant state drivers of complex, multi-stage manufacturing systems. This approach is able to utilize complex, diverse and high-dimensional data sets, which often occur in manufacturing applications, and to integrate the important process intra- and interrelations. The approach has been evaluated using three scenarios from different manufacturing domains (aviation, chemical and semiconductor). The results, which are reported in detail in this book, confirmed that it is possible to incorporate implicit process intra- and interrelations on both a process and programme level by applying SVM-based feature ranking. In practice, this method can be used to identify the most important process parameters and state characteristics, the so-called state drivers, of a manufacturing system. Given the increasing availability of data and information, this selection support can be directly utilized in, e.g., quality monitoring and advanced process control. Importantly, the method is neither limited to specific products, manufacturing processes or systems, nor by specific quality concepts.

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