

Chapter 1

MANUFACTURING

Keynote Abstract: 1, Introducing Keynote Speaker Prof. Dr. Marco Huber

Cognitive Production Systems – Machine Learning in Industrial Manufacturing

Machine learning (ML) methods have recently led to enormous progress in the field of artificial intelligence. It allows the automatic recognition and exploitation of correlations and patterns in complex data. The application of ML is particularly useful in applications where cause-effect relationships are very difficult or impossible to describe analytically using mathematical methods, but instead extensive data is available. This situation is encountered in many places in industrial manufacturing. Production facilities are continuously monitored by various sensors so that ML processes can be triggered, action plans can be generated and then executed, resulting in continuous optimizations of production processes. In this talk, first a brief introduction to the topics of artificial intelligence and ML is given, together with highlighting the benefits and limitations. This will be followed by an introduction of basic ML principles. This is combined with providing insights to a large number of real-world use cases solved at Fraunhofer IPA together with different manufacturing companies.



Figure 1.1: Prof. Dr. Marco Huber (University of Stuttgart/IPA Fraunhofer)