

Towards Industrial Machine Intelligence

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Abstract

The next decade will see a deep transformation of industrial applications by big data analytics, machine learning and the internet of things. Industrial applications have a number of unique features, setting them apart from other domains. Central for many industrial applications in the internet of things is time series data generated by often hundreds or thousands of sensors at a high rate, e.g. by a turbine or a smart grid. In a first wave of applications this data is centrally collected and analyzed in Map-Reduce or streaming systems for condition monitoring, root cause analysis, or predictive maintenance. The next step is to shift from centralized analysis to distributed in-field or in situ analytics, e.g., in smart cities or smart grids. The final step will be a distributed, partially autonomous decision making and learning in massively distributed environments.

In this talk, I give an overview on Siemens' journey through this transformation, highlight early successes, products and prototypes and point out future challenges on the way towards machine intelligence. I also discuss architectural challenges for such systems from a Big Data point of view.

Michael May is Head of the Technology Field Business Analytics & Monitoring at Siemens Corporate Technology, Munich, and responsible for eleven research groups in Europe, US, and Asia. Michael is driving research at Siemens in data analytics, machine learning and big data architectures. In the last two years he was responsible for creating the Sinalytics platform for Big Data applications across Siemens' business.

Before joining Siemens in 2013, Michael was Head of the Knowledge Discovery Department at the Fraunhofer Institute for Intelligent Analysis and Information Systems in Bonn, Germany. In cooperation with industry he developed Big Data Analytics applications in sectors ranging from telecommunication, automotive, and retail to finance and advertising.

Between 2002 and 2009 Michael coordinated two Europe-wide Data Mining Research Networks (KDNet, KDubiQ). He was local chair of ICML 2005, ILP 2005 and program chair of the ECML/PKDD Industrial Track 2015. Michael did his PhD on machine

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