

Data Sensing and Fusing for Production Machinery Maintenance: Digital Assistance with Post-Analysis, Diagnostics and Prognostics

Keynote Summary

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Industrial systems need real-time data analytics. Such analytics (post-analysis, diagnostics, and prognostics) are based on data received from multiple sensors that cover a target industrial production machinery. The sensed data are fused to create a digital model describing the technical state, utilization conditions, and underlying manufacturing processes. In this keynote talk, we consider Industrial Internet of Things technologies for data sensing and fusion that support service-based assistance in real-time. The data processing system implements edge computing principle. The processing modules are sensing module, control module, tensor module, storage module, and communication module. The edge computing modular system fuses the data sensed from multiple sources. The output (preprocessed aggregated data) keeps information about recognized events. Based on this information advanced services of digital assistance can be constructed in the form of dashboards and personalized assistants, including mobile scenarios. We consider several case studies with a production metalworking machine, where the analytics are based on traditional methods for data processing (e.g., signal processing) as well as on emerging methods of artificial intelligence (e.g., neural networks).