

PRESS RELEASE

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Analytical tool identifies production errors and their causes in real time

“Smart System Optimization” at IMTS2018

With its “Smart System Optimization”, Fraunhofer IPA has developed a tool that identifies errors in interlinked manufacturing systems and shows their root causes. In order to do this, high-performance machine control connectors and external sensors such as smart cameras record relevant process characteristics. Subsequently, an analytical tool interprets the data in real time. This means that fully automated production systems with short cycle times can be optimized while also enabling automated machine benchmarking of comparable machines. The analytical tool will be presented at the International Manufacturing Technology Show in Chicago from September 10 to 15, 2018.

Complex and capital-intensive manufacturing systems, companies must always maximize productivity. However, many manufacturing systems encompass a variety of stations and work so quickly that sources of errors can no longer be manually identified. In a survey of 147 participants, Fraunhofer IPA determined that there is a high demand for a solution to optimize interlinked systems. Project manager Felix Müller confirms: “The more complex the system, the lower the productivity.” He adds that the pharmaceutical and consumer goods industries are particularly affected.

Tool identifies errors and their causes

With the “Smart System Optimization”, data collection and analysis is completely automated. Selflearning algorithms that were developed specifically to analyze fast-acting production lines of discrete goods were a key technology. A high-performance connector is used to collect data “from the inside”, accessing data from the machine controller (PLC) in high frequency. If the PLC-data is not sufficient smart cameras also record the relevant process characteristics “from the outside”. This creates a continuous data stream that is synchronously transmitted to the big data analytics tool. This can then draw conclusions with the aid of the algorithms, give a feedback in real time to operators and prepare the information in the desired form.

The tool also works out how to link the errors and can prioritize them. It is suitable for automated machine benchmarking too. This means that all machines in a fleet can be brought to the highest possible level.

Press Communication

Jörg-Dieter Walz | Phone +49 711 970-1667 | presse@ipa.fraunhofer.de

Fraunhofer Institute for Manufacturing Engineering and Automation IPA | Nobelstrasse 12 | 70569 Stuttgart | www.ipa.fraunhofer.de

Successfully implemented at several companies

Fraunhofer IPA has already implemented the tool in industry several times. At SCHOTT Schweiz AG, the overall equipment effectiveness (OEE) was increased by around 10% for a highly automated production system manufacturing syringes.

At Freudenberg Sealing Technologies (FST), the researchers implemented the interlinked machine benchmark, leading to a reduction in cycle time of up to 10% per machine. Currently, Fraunhofer IPA researchers are working on expanding the sensors of the Smart System Optimization and developing algorithm packages for short term failure prediction. They also plan to make the connector available for even more machine controllers, allocate currently unrecognizable errors in an automated way, and make error images comprehensible for production employees, in real time.

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Information on IMTS2018 – International Manufacturing Technology Show**When:** September 10 to 15, 2018**Where:** McCormick Place (East Building/Lakeside Center) 2301 S Lake Shore Drive, Chicago, IL**Fraunhofer stand:** Level 2, Stand No. 121815**Fraunhofer main theme:** MANUFACTURING THE FUTURE – The Evolution of Industry 4.0**Website:** <https://www.imts.com/>**Caption 1**

With smart cameras and a high performance machine controller connector, Fraunhofer IPA's "Smart System Optimization" identifies production errors and their causes. (Source: University of Stuttgart IFF/Fraunhofer IPA)

Photo: Rainer Bez)

Specialist Contact Partner

Felix Müller | Telefon +49 711 970-1974 | felix.mueller@ipa.fraunhofer.de | Fraunhofer Institute for Production Technology and Automation IPA | www.ipa.fraunhofer.de

With nearly 1000 employees, the **Fraunhofer Institute for Manufacturing Engineering and Automation IPA**, Fraunhofer IPA, is one of the largest institutes in the Fraunhofer-Gesellschaft. It has an annual budget of approximately 63 million euros, of which more than one third derives from industrial projects. The institute's research focus is on organizational and technological aspects of production. We develop, test and implement not only components, devices and methods, but also entire machines and manufacturing plants. Our 14 departments are coordinated via six business units, which together conduct interdisciplinary work with the following industries: automotive, machinery and equipment industry, electronics and microsystems, energy, medical engineering and biotechnology as well as process industry. The research activities of Fraunhofer IPA aim at the economic production of sustainable and personalized products. We regard cyber-physical production processes as topics of the future.