

FRAUNHOFER INSTITUTE FOR NONDESTRUCTIVE TESTING IZFP  
ILMENAU UNIVERSITY OF TECHNOLOGY

## PRESS RELEASE

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**PRESS RELEASE**

Saarbrücken, October 23, 2019 ||

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**TU Ilmenau and Fraunhofer IZFP develop intelligent sensor technology for processing Big Data**

The Ilmenau University of Technology is intensifying its research efforts in order to master the rapidly growing amount of data in the course of digitization. The novel idea for “intelligent” sensors: Record required data for the respective work process at an early stage and thus reduce the quantity to be processed. In order to achieve the ambitious research objectives, TU Ilmenau is planning a new professorship in collaboration with the Fraunhofer-Gesellschaft, which in turn will intensify the activities of its established research group SigMaSense. The Free State of Thuringia is supporting these activities this year with 150,000 euros. On 21 October 2019, Thuringia's Science Minister Wolfgang Tiefensee at TU Ilmenau also announced further support for the expansion of the research group and its establishment as a branch office of the Fraunhofer Institute for Nondestructive Testing IZFP in Saarbrücken with a total of up to 2.4 million euros from 2021.

Conventional data processing methods capture the entire amount of data, often resulting in highly redundant measurement signals that then have to be evaluated in a further step. This not only calls for high expenditure, but in most cases only a small portion of the accumulated data material is needed for the respective work process. Since the beginning of 2018, TU Ilmenau's and Fraunhofer IZFP's research group “SigMaSense” (Signal Processing for Material Data Acquisition using Smart Sensors) has been working on novel methods for obtaining intelligent data. The new approach: Let the sensor only record what is actually needed. Dr. Florian Römer, scientific head of SigMaSense, intends to develop “intelligent” sensors: “Instead of simply recording data all the time, the sensors should learn to think and independently decide which data is relevant and which is not. This way we keep only the part of the data that is actually needed.”

Instead of large piles of data, which have to be stored and scanned for certain patterns, selected, condensed data could be obtained in this way. Welcome side

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effect: The new process reduces the energy consumption of the sensors, the communication interfaces and the data storage devices. The result will be not only intelligent but also “green” sensors.

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*Giovanni Del Galdo and Florian Römer from  
“SigMaSense”, Randolph Hanke (Fraunhofer IZFP),  
Rector Peter Scharff and Minister Wolfgang  
Tiefensee (from left) present the new  
perspectives for Ilmenau.  
© TU Ilmenau*

### **Cognitive Sensor Systems – Efficient Processes**

Fraunhofer IZFP is an internationally networked research and development institute in the field of applied research. Its activities are focused on the development of “cognitive sensor systems” for the nondestructive monitoring of industrial processes and value chains. The Institute's technical understanding of inspection and sensor physics is supplemented by technologies and concepts from AI research, which are used to develop sensor systems for the NDT of tomorrow. In addition to pure production processes, the activities cover equally processes from materials and product development, maintenance, repair, and recycling of materials.

The current research focus relates to the development of sensors that are suited to capture production-related microstructural patterns and to merge them in the sense of an individual fingerprint, a so-called “product DNA”. In the future, these “digital product files” will open up completely new approaches for the optimization of the individual sectors of a material and product lifecycle.

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The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 72 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of more than 26,600, who work with an annual research budget totaling more than 2.6 billion euros. Of this sum, more than 2.2 billion euros is generated through contract research. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.