

PRESS RELEASE

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At the Hannover Messe 2021, Fraunhofer IIS will be showing precise, cognitive technologies and solutions for IoT and 5G

Hanover/Nuremberg/Erlangen: What do localization and networking have in common with the Internet of Things? Both technologies are the basis for interactive and self-sufficient Industry 4.0 processes and smart mobility applications. A self-calibrating localization system allows flexible processes, tools, driverless transport systems, assembly systems etc. set-up, re-design and adapt to new work processes easily and in real time - in the production hall as well as outdoors. Beautiful vision or reality? The Fraunhofer Institute for Integrated Circuits in cooperation with the Fraunhofer CCIT Research Center IoT Comms will show how this can be achieved at Hannover Industry Trade Show 2021. For this, the localization and communication specialists will present technologies and solutions as well as a unique 5G testbed for Industry 4.0, in which companies can already realize and experience tomorrow today.

Self-measuring and flexible: FlexLoc - the basis for agile production design

In the human-machine interaction and in the adaptation of processes to new requirements in product manufacturing, the FlexLoc technology of the IIS creates a future-oriented and flexible positioning system. An intelligent positioning system introduced locally into the industrial environment can locate mobile automated guided vehicle AGVs, intelligent tools or workpieces at any time via radio anchor nodes. This makes the system flexible and can be quickly adapted, for example, if workstations are shifted, transport systems move, new intelligent tools are integrated into the production process or production employees walk between the machines in the production hall.

The ad-hoc system FlexLoc is self-calibrating and the registration/de-registration of tools, vehicles or other agents works in real time and without complex calibration steps. An important advantage of the system is also its scalability and expandability as well as the possibility of being able to integrate the system quickly into existing plants or facilities at any time.

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Ultra-reliable and in real time

This level of performance is of paramount importance in real-time-critical applications such as motion control, rotation control, or isolation control. In this way, UWIN technology gives added flexibility to production processes. Using a wireless connection to control remote parts of a machine allows them greater freedom of mobility, because they are no longer constrained by cables.

Smart, learning tools

The retrofit capable and intelligent sensor module for hand-held tools ensures transparency for maintenance processes and quality assurance in production. Several sensors detect both actions (e.g. tightening or loosening screws) as well as the position and sequence of the work steps. The worker receives feedback in real time about the progress of his work via an app immediately if the target process deviates. The processing chains will be trained using automatic machine learning. The entire process of training and evaluating new models is completely automated and does not require any expert knowledge

Components that think ahead

In "Structural Health Monitoring", the intelligent screw / clamp connection can make full use of its advantages. The screw connection measures the pre-tensioning force of the screw connection using a special thin layer. If this changes, the integrated mioty® radio technology automatically transmits this change to a control system. The sensor is supplied by energy harvesting technologies and is therefore completely self-sufficient from any other power supply. There is also the option of integrating the sensors into a large network (low-power wide-area network) using mioty® technology and thus also ensuring safe, robust and large-area transmission of the sensor data in environments that are demanding in terms of radio technology, such as large production facilities.

5G positioning for industry - 5G Bavaria Testbed Industry 4.0

The use of positioning technologies based on 5G / 6G is an important factor, especially for mobile applications in industry. With the 5G Bavaria test center and the test bed for Industry 4.0 in Erlangen and Nuremberg, Fraunhofer IIS offers an optimal development and test environment for 5G-based IoT technologies and applications. With many years of recognized knowledge in radio positioning, our participation in leading standardization bodies and a sophisticated infrastructure, we add significant values for fast and efficient product development.

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The Fraunhofer-Gesellschaft, headquartered in Germany, is the world's leading applied research organization. Its research activities are conducted by 75 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 29,000, who work with an annual research budget totaling more than 2.8 billion euros.

The **Fraunhofer Institute for Integrated Circuits IIS**, headquartered in Erlangen, Germany, conducts world-class research on microelectronic and IT system solutions and services. Today, it is the largest institute of the Fraunhofer-Gesellschaft. Research at Fraunhofer IIS revolves around two guiding topics:

In the area of **"Audio and Media Technologies"**, the institute has been shaping the digitalization of media for more than 30 years now.

Fraunhofer IIS was instrumental in the development of mp3 and AAC and played a significant role in the digitalization of the cinema. Current developments are opening up whole new sound worlds and are being used in virtual reality, automotive sound systems, mobile telephony, streaming and broadcasting.

In the context of **"cognitive sensor technologies"**, the institute researches technologies for sensor technology, data transmission technology, data analysis methods and the exploitation of data as part of data-driven services and their accompanying business models. This adds a cognitive component to the function of the conventional "smart" sensor.

More than 1100 employees conduct contract research for industry, the service sector and public authorities. Founded in 1985 in Erlangen, Fraunhofer IIS has now 16 locations in 12 cities: Erlangen (headquarters), Nuremberg, Fürth, Dresden, further in Ilmenau, Munich, Bamberg, Waischenfeld, Coburg, Würzburg, Deggendorf and Passau. The budget of 167.9 million euros is mainly financed by projects. 29 percent of the budget is subsidized by federal and state funds.

Detailed information on: www.iis.fraunhofer.de/en