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**Hannover Messe 2021 Digital Edition:
5G Bavaria testbed for Industrie 4.0 applications**

Increasing efficiency in logistics and production: Fraunhofer IIS presents the Industrie 4.0 testbed

The Fraunhofer Institute for Integrated Circuits IIS is set to present a 5G testbed for Industrie 4.0 applications at the Hannover Messe 2021 from April 12-16. The development of 5G-based solutions is a crucial element in the implementation of new industrial IoT applications. Companies can try out various applications on this 5G testbed in Nuremberg under realistic conditions and have them developed. They benefit from the neutral expertise of Fraunhofer IIS as a partner for research, technology development and evaluation, as well as for technical consulting.

In production and logistics scenarios, 5G is a key technology for new solutions. This technology allows cable connections to be replaced by real-time-capable, reliable, low latency (0.5 to 500 ms) networks, and is paving the way for automated production processes through accurate localization (between 0.2 and 10 m).

5G testbed for simulating and testing individual wants and needs

The indoor and outdoor areas of the L.I.N.K. Test and Application Center – short for localization, identification, navigation, communication – at the Nuremberg location provide a realistic environment for the Industrie 4.0 5G testbed. All outdoor, indoor and transitional areas of the testing ground are equipped with interconnecting communication and localization solutions. Ideal for testing various industrial applications in scenarios with a practical relevance. Especially manufacturing and logistics companies, localization system providers, system integrators and mobile network operators that require simple access to a 5G testing infrastructure to try out their solutions and refine them for sale could benefit from this facility.

Thomas von der Grün, Project Manager of the 5G Bavaria Industrie 4.0 testbed explains: “The implementation of Industrie 4.0 applications in 5G networks presents a real challenge. To help meet this challenge, we are offering a stand-alone campus network based on the 3.7 gigahertz frequency range as the place to go for testing industry-oriented applications in the early stages of development. Our mission here is to help companies and partners experience aspects of their applications today that they can expect the 5G standard to deliver only in one to two years’ time. We would like to, and indeed already can, show you what this technology can do.”

Editorial Notes

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The 5G testbed for Industrie 4.0 applications of Fraunhofer IIS supports the transition from research and standardization to a company's everyday routine. It offers an open test environment in which customer-specific applications from the industrial and logistics sectors can be tested under realistic conditions using the latest mobile network technology in a stand-alone 5G campus network.

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"The 5G Industrie 4.0 testbed allows companies to prepare for the industrial use of 5G and consider their requirements and specific business processes from the word go," explains Thomas von der Grün. "They can test newly standardized 5G features in a secure environment before they become available across the board. Even small and medium-sized enterprises can sound out technological potentials and boundaries at an early stage and amass valuable experience for setting up, operating and using their own campus network." Because the 5G Bavaria testbed is a private stand-alone network, all components of the 5G network are locally installed and accessed.

5G has the ability to enhance the performance of wireless connections in industrial environments and, as a result, is creating new potentials for realizing even highly complex and security-critical applications in wireless fashion. "We could conceivably employ this technology to efficiently control automated guided vehicles (AGV) in densely populated halls without a line of sight or for handling swarms of cooperative drones," adds von der Grün. "But we can also implement traffic flow mapping, efficient route management and optimum capacity utilization with the help of 5G. And networked logistics flows help prevent accidents and improve occupational safety."

Open RAN as a manufacturer-neutral and flexible approach

The 5G standard allows a flexible and dynamic 5G testbed architecture. The open interface definition based on the Open RAN (Radio Access Network) approach means we can combine components from different manufacturers. And virtualization enables soft-ware functions, for example, to be distributed across the company premises as needed for localization within the 5G network. This reduces latency, for instance.

Background: 5G as the new standard

The mobile network world is currently working at full speed on the transition from LTE to 5G in public networks. In the future, the new standard will offer much more for industrial and logistics applications. 5G is also giving smart grids and networked driving a major boost. Consequently, companies from completely new sectors will have the opportunity to establish their products and applications based on the latest mobile network technologies. It is vitally important to know what is already being pushed in standardization today and what is in the pipeline for implementation in the mobile communication providers' networks. The testing and development of future-proof communication and localization applications with adequate testing facilities and detailed knowledge of the progressive 5G standardization are key to being able to take

action and make decisions in the window of opportunity ahead of commercial availability.

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The “5G Bavaria” initiative of Fraunhofer IIS is therefore supporting the transition from research and standardization to the application. This initiative is offering companies the opportunity to evaluate new functionalities of 5G ahead of market availability in a 5G overall system context by means of simulation and emulation in both the laboratory and a real mobile communication environment. Companies and users from vertical markets will be able to experience and use 5G, and test and refine their 5G-based applications and developments at an early stage.

During the Hannover Messe 2021 Digital Edition from April 12-16, anyone interested is welcome to visit the Fraunhofer virtual booth to find out more about the 5G testbed for Industrie 4.0 applications.

Video clips of the 5G Bavaria testbed:

<https://www.iis.fraunhofer.de/de/ff/kom/mobile-kom/5g-bavaria/5G-testbed-industrie.html>

Further information on the L.I.N.K. Test and Application Center:

<https://www.iis.fraunhofer.de/de/profil/standorte/linkhalle.html>



Picture 1 The 5G Bavaria testbed is the place for companies to go and test their industry-oriented applications in the early stages of development.

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