Industry
at Fraunhofer HHI

The fourth industrial revolution envisions a modular, digital, and highly flexible manufacturing industry relying on secure, resilient, and real-time capable communication and computing infrastructures. The industrial communication and digitization are building the foundation for Industry 4.0 and pave the way for the factory of the future. Fraunhofer HHI offers solutions for a holistic industrial infrastructure through its wide-ranging competencies in relevant technology fields.

Competencies at Fraunhofer HHI

Data and Artificial Intelligence Enablement

- Design of massive wireless sensor networks
- Blockage detection and prediction for robust and seamless connectivity
- Radio optimization for challenging environments
- Network telemetry protocols and tools for network analytics
- Traffic analysis and prediction for scalability
- Predictive maintenance

Computer Vision for Industry

- AR assistance in production, inspection and construction of complex facades
- Collaborative human-machine workstations
- Fast, user-friendly, accurate, and mobile 3D reconstruction
- Vision-based inspection of hard-to-reach parts
- New methods for reliable and accurate measurements
- Calibration and evaluation of sensor systems

Campus Networks

- Resource allocation for campus networks, e.g., Network Slicing and Time-Sensitive Networking
- Highly reliable and low-latency communication protocols, e.g., for live streaming resilience
- Autonomous networking and optimizations, e.g., network scalability, energy efficiency, and self-organizing networks (SONs)
- Disaggregation and dynamic placement of network functions
- Network planning, (channel) measurements and validation
- Programmable Data Planes in wired and wireless networks
- Network-enabled AI for Smart Factory applications

Use Cases and Applications

- Remote predictive maintenance for selected types of industrial machinery through secure and robust radio connections (also from machine to machine)
- AR assistance for human-machine collaboration in industrial environments (production, maintenance of machines, etc.)
- Remote AR assistance in production for the training of employees
- Digital twins as virtual replicas of industrial machines or processes
- Planning and optimization of radio networks in industrial environments and in the logistics sector
- Network slicing for latency- and bandwidth-critical industrial applications, e.g., deployment of mobile robotics and autonomous vehicles
- Robust 3D reconstruction of complex machinery and facilities

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