



dependable
secure
time-aware
sensor networks

Dependable, secure and time-aware sensor networks - Overview

DI Herwig Zeiner + DeSSnet Consortium, 18/6/2018

The K-Project DeSSnet is funded within the context of COMET – Competence Centers for Excellent Technologies by the Austrian Ministry for Transport, Innovation and Technology (BMVIT), the Federal Ministry for Digital and Economic Affairs (BMDW), and the federal states of Styria and Carinthia. The programme is conducted by the Austrian Research Promotion Agency (FFG).



Dependable, secure and time-aware sensor networks

Vision

- ▶ Internet of Things (IoT) and cyber physical systems (CPS) have **considerable impact** on a **wide range of industries** and operational sectors
- ▶ A major challenge in the **digital transformation** of industry is the acquisition, time-aware analytics and managing of complex processes by means of highly advanced and **dependable wireless sensing systems**
- ▶ Strengthen the involved regions Styria and Carinthia



SILICONALPS



Goals

- ▶ Enable the future usage of **wireless sensor networks as dependable and as cost-efficient as possible**
- ▶ Cover the **whole value chain of wireless sensor networks**
- ▶ Develop **key enabling technologies (KETs)** for sensor and communication technologies (interoperable, energy efficient), security technology, network dependability and time-aware analytics



Consortium





Key Enabling Technologies



Wireless Sensors and Communication

Robust hardware, Wireless Power Transfer, Sensor Add-ons



Security

Security Analysis, Counter Measures, Cryptography



Network Dependability

Interference Management, Cooperative Diversity, Cross-layer Protocols



Time-aware Analytics

Predictive Data Analytics, Distributed Decision Making, Edge Computing

Innovation Lab
(Pilots)

Automotive
Environment

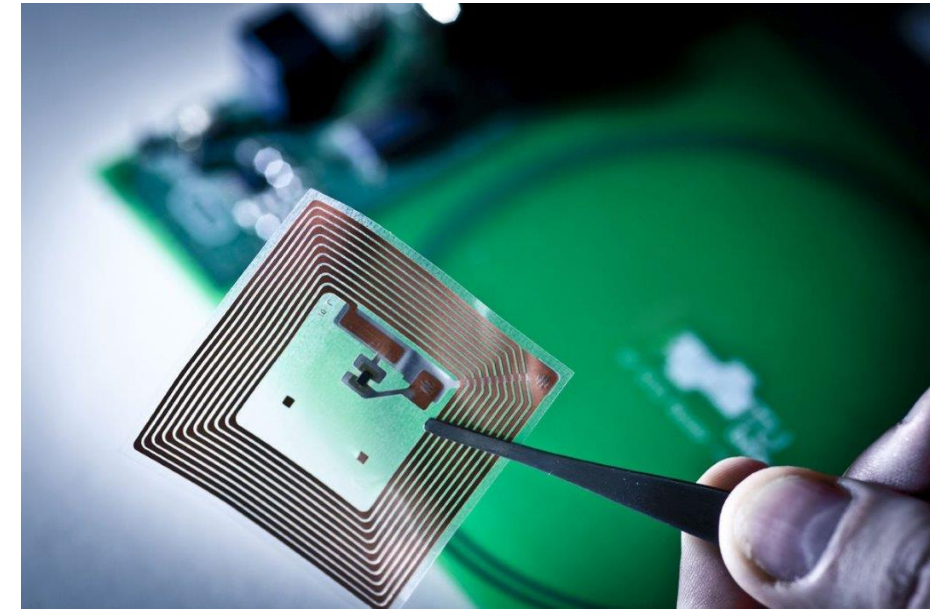
Production
Lifecycle



Key Enabling Technologies and Services

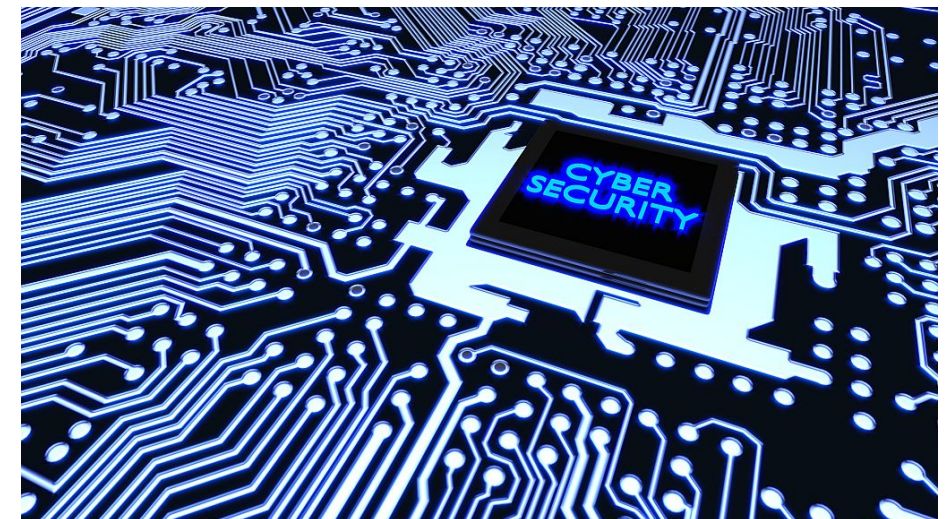
▶ Sensors and Communication

- ▶ Dependable Wireless Power Transfer and Communication Technologies
- ▶ Sensor Add-Ons for Wireless Communication Chips - for low cost status information monitoring in harsh application environments (e.g., in an automotive test factory)
- ▶ Miniaturized Integrated Wireless Sensors - Application integrated (i.e., low profile, miniaturized, adaptive) wireless sensors to monitor environmental parameters (e.g., temperature, humidity etc.)



▶ Security

- ▶ Security Analysis and Requirement
- ▶ Software Security – devices with a software stack
- ▶ Secure and Efficient Implementation/Execution of Cryptography





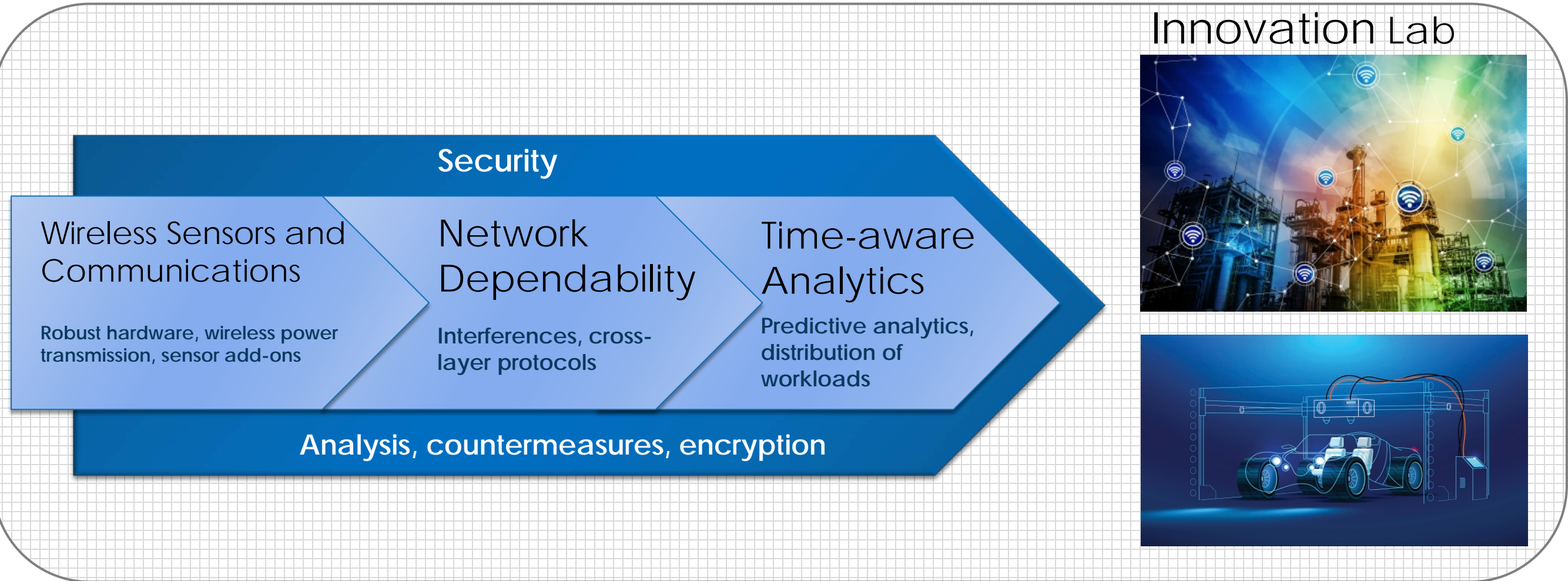
Key Enabling Technologies and Services

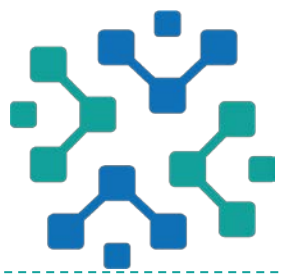
- ▶ **Network Dependability**
 - ▶ Concepts for Dependable Networking
 - ▶ Interference Management and Cooperative Diversity
 - ▶ Implementation and first Experimental Testing – focus on wireless sensor networks
- ▶ **Time-aware Analytics**
 - ▶ Time-aware Concepts – Mechanisms of time-aware, time-preserving, and timing-predictable computing
 - ▶ Predictive Data Analytics
 - ▶ Distributed Decision Making – decision at the node or at the gateway





Innovation Lab: Automotive & Production





Funding



Competence Centers for
Excellent Technologies

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Federal Ministry for
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