

IKT der Zukunft 2020

Wireless Communications Research Challenges

AIT – Austrian Institute of Technology

DSS – Center for Digital Safety and Security

Laura Bernadó

AIT DSS – Physical Layer Security

AIT Austrian Institute of Technology

Employees: 1300+
 Total Revenues: 140 Mio €
 Business Model: 40:30:30

Energy	Health & Bioresources	Digital Safety & Security	Vision, Automation & Control
Mobility Systems	Low-Emission Transport	Technology Experience	Innovation Systems & Policy

Strategic Partnerships Innovation System

6G URLLC WIRELESS RESEARCH @ AIT

Connected vehicles	Industry 4.0	Transport	UAV
<p>Know How: - distributed massive MIMO SDR system - multi-node SDR channel measurements - massive MIMO for URLLC with vehicles</p>		<p>- real time channel emulation - GPU ray tracing - system level simulation of vehicular communication</p>	<p>- mm-Wave for vehicles - physical layer security</p>

Research TOPICs and TECHNOLOGIES

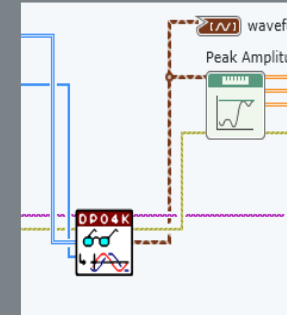
Ultra reliable low latency M2M communications

- maximize diversity
- channel modeling
- RT and GSCM



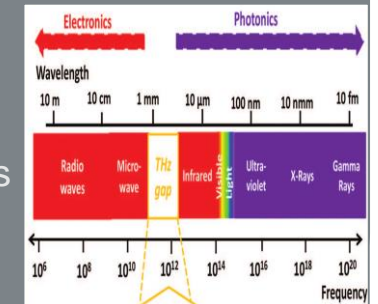
Software defined radio rapid prototyping

- multi channel proc.
- phase coherency
- real-time implement.



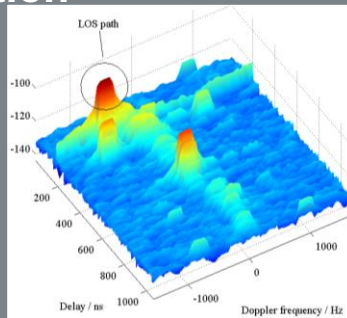
Optical / RF interface

- mmWave & THz
- antenna arrays
- remote radio heads



Wireless channel measurement and characterization

- high mobility
- multi node
- distributed massive MIMO
- mmWave



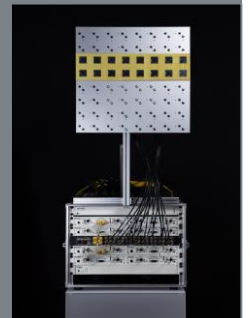
Real-time channel emulation

- continuous delay
- continuous Doppler
- unlimited paths



Distributed Massive MIMO

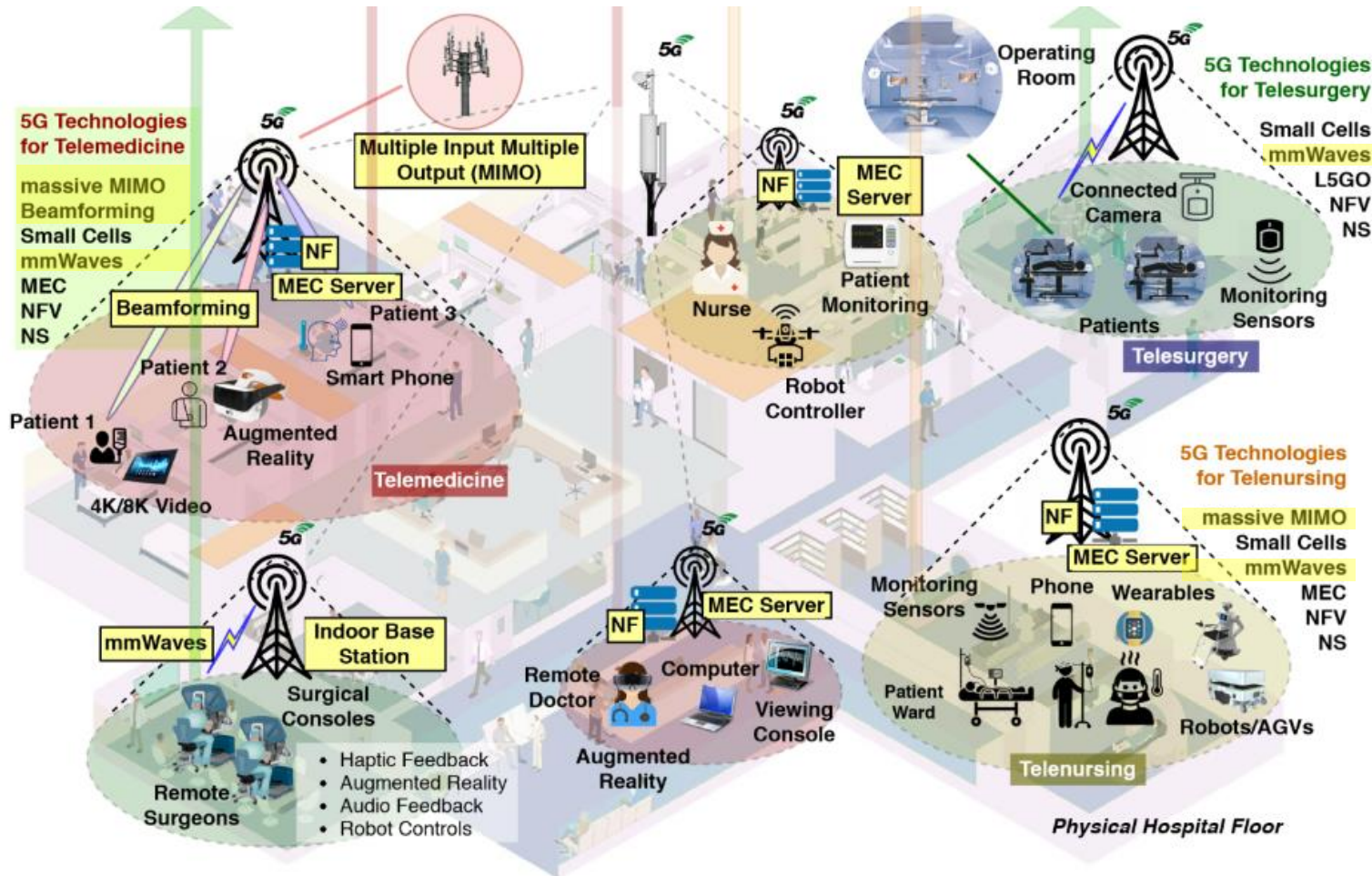
- SDR test platform
- optical synchronization
- 500m array distance



IKT der Zukunft Ausschreibung 2020

Interdisziplinäre IKT für Resilienz und Distancing

Potential use cases of interest for AIT-DSS in telehealth using 5G/6G communication technologies:



5G / 6G
Wireless
Technologies

Telemedicine:

remote clinical services such as healthcare delivery, diagnosis, consultation, treatment where a healthcare professional utilizes communication infrastructure to deliver care to a patient at a remote site.

High data rates
Low latency

Telenursing:

use of telecommunication technologies to deliver nursing care, patient monitoring and conduct nursing practice.

High data rates
Low latency

Telepharmacy:

service which delivers remote pharmaceutical care via telecommunications to patients who do not have direct contact with a pharmacist. (e.g. remote delivery of prescription drugs).

Low latency
High reliability

Telesurgery:

perform surgical procedures over a remote distance.

Ultra low latency
Extremely high reliability

More information about our research activities in:

Wireless M2M Communication

<https://www.ait.ac.at/en/research-topics/physical-layer-security/wireless-m2m-communication/>

5G & Broadband Technologies

<https://www.ait.ac.at/en/research-topics/physical-layer-security/5g-broadband-technologies/>

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