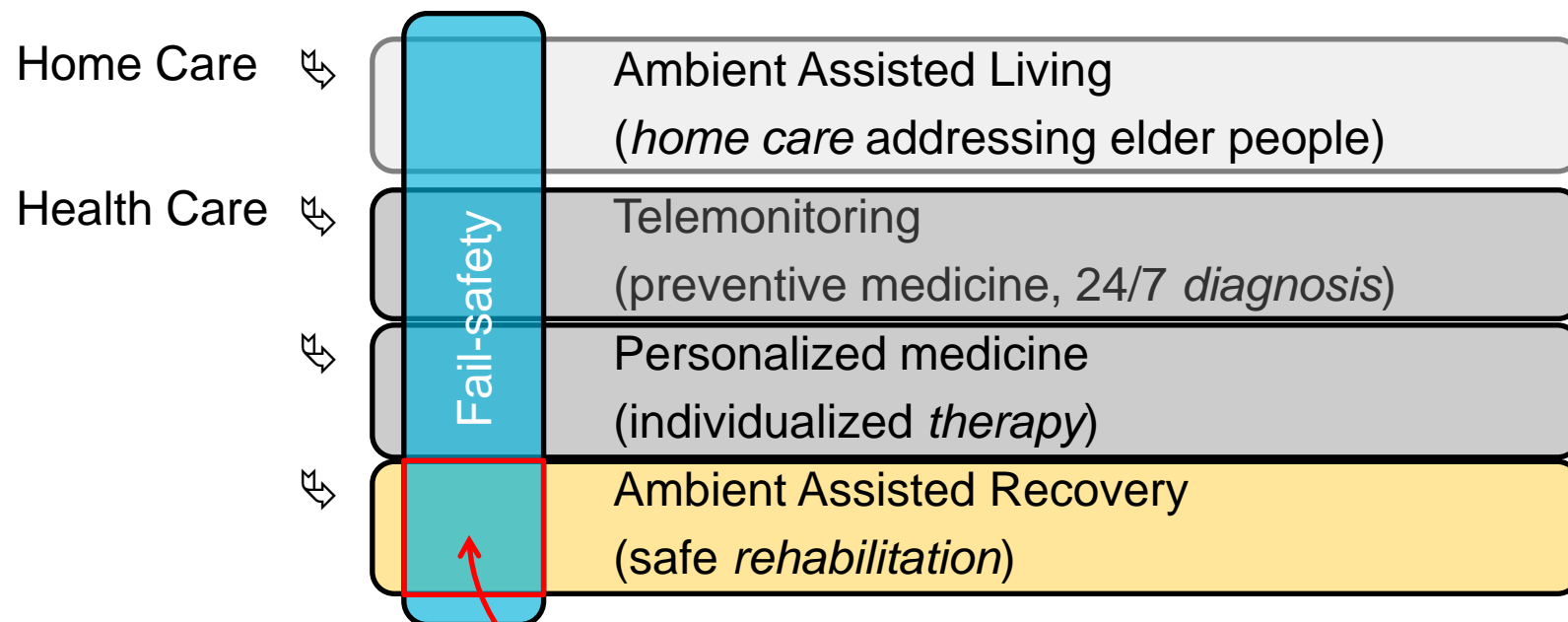


TUHH Initiative “Fail Safety in Ambient Assistance for Recovery”



Technical innovations provide solutions to improve efficiency & to lower costs



In the focus of the TUHH AA4R Initiative

Research & development ...

- of an ambient assistance technology
- under stringent requirements of fail-safety
- for safe rehabilitation

“End-to-End” care enabled by uninterrupted use of AA4R technology on-ward, in rehab center, and at home.

Operating room (OR)

Intensive care unit (ICU)

Ward



Rehab Center

Home



Working environment

Human life is at stake → Fail-safety to sense,

communicate,

decide,

verify,

act,

secure

Safe data access, secure privacy

Instrumentation of the environment

Instrumentation of the patient



data

information

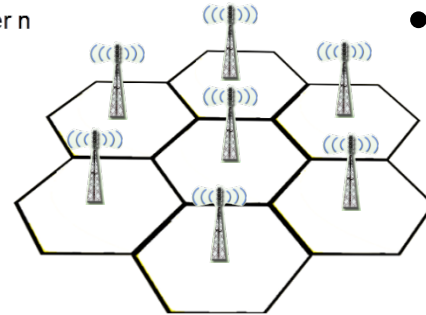
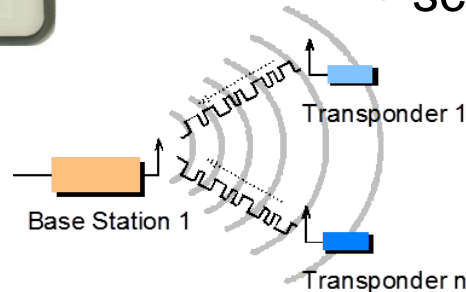
Reliably linking patient, medical server, and hospital

feedback



The vision of AA4R requires fundamentally new types of...

- sensors & actuators
- autonomous systems
- wireless transmission
- scalable ICT architecture
- fault-tolerant networks
- fail-safe software
- Novel fault models



Fail safety must crosscut through all layers of hardware and software



**7 institutes
in cooperation with
medical & industrial
partners**

Communication Networks

- Wireless ad hoc and sensor networks
- Mobile communication networks
- Future Internet
- Network planning and optimization

Telematics

- Power aware computing
- Wireless communication
- Embedded systems
- Fault tolerance

Software Systems

- Software analysis and formal methods
- Testing and verification
- Software-implemented hardware fault tolerance
- Cyber-physical systems and dependable systems

Security in Distributed Applications

- Software security and security evaluation
- Communications security and cryptography
- Security for cyber-physical systems
- Risk analysis

Intelligent Autonomous Software Systems

- Agents and mechanisms
- Formal logic for modeling and verification
- Interpretation and fusion of media and data streams
- Machine learning

Microsystems Technology

- Implantable and wearable sensors & actuators
- Wireless power and data transmission
- Smart system integration
- Energy autonomous systems

Nanoelectronics

- ASICs for biomedical applications
- Electrical characterization of integrated circuits
- Systems for acquisition of bioelectrical signals
- Low power implantable systems



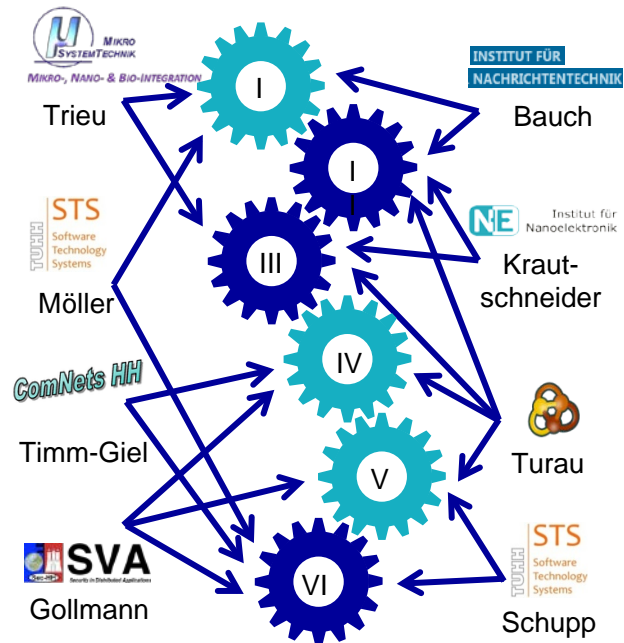
AA4R-Team, November 2012

www.aa4r.org

TUHH

Technische Universität Hamburg-Harburg

Thank you very much for your attention!



on behalf of the **AA4R-Team**

Prof. Dr. Sibylle Schupp

Tel: 040 42878-3460, Email: schupp@tuhh.de

Prof. Dr. Hoc Khiem Trieu

Tel: 040 42878-4398, Email: trieu@tuhh.de

Dr. Karin Renner

Tel: 040 42878-4606, Email: karin.renner@tuhh.de

Comments and questions are welcome.