Recovery at home & still reliably connected to the hospital

Post-intensive treatment phase
Patient still needs
- Health monitoring and reporting
- Close attention from clinicians

Question: Still staying at the hospital?
Answer: Release into the home environment
- Reduces stress
- Activates the recovery process
- Reduces costs
- Fosters a trend already visible today (ongoing decrease in the average length of stay in hospitals)

AA4R will provide a solution to support quality of medical care by simultaneously increasing efficiency and lowering cost.

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

Cooperation with complementary expertise

Software Systems
(Prof. S. Schupp, co-speaker)

Microsystems Technology
(Prof. H.K. Trieu, co-speaker)

Security in Distributed Applications
(Prof. D. Gollmann)

Intelligent Autonomous Systems
(Prof. R. Möller)

Nanoelectronics
(Prof. W. Krautschneider)

Communication Networks
(Prof. A. Timm-Giel)

Telematics
(Prof. V. Turau)

Communications
(Prof. G. Bauch)

Vision Systems
(Prof. R. R. Grigat)

in cooperation with medical and industrial partners.

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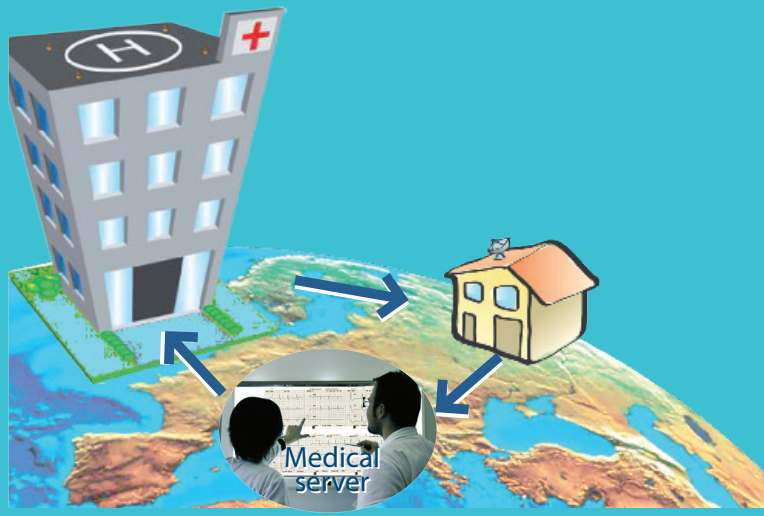
AA4R
Fail Safety

Fail Safety in Ambient Assistance for Recovery



TUHH
Hamburg University of Technology

Challenges in Health and Home Care

Health care and home care face enormous challenges due to changes in demography and a tremendous increase of wide-spread diseases.

Technical innovations provide solutions to improve efficiency and to lower cost.

Fail safety

- Ambient Assisted Living (home care addressing elder people)
- Telemonitoring (24/7 diagnosis, preventive medicine)
- Personalized Medicine (individualized therapy)
- **AA4R** — Ambient Assistance for Recovery (safe rehabilitation)

Fail Safety in Ambient Assistance for Recovery

The focus of the TUHH initiative AA4R is the research and development of an ambient assistance technology for safe rehabilitation under stringent requirements of fail safety.

The AA4R technology will benefit patients during their recovery process under various indications including chronic pain, wound healing, osteosynthesis, post-transplantation monitoring, stroke, cardiac or nephrological diseases.

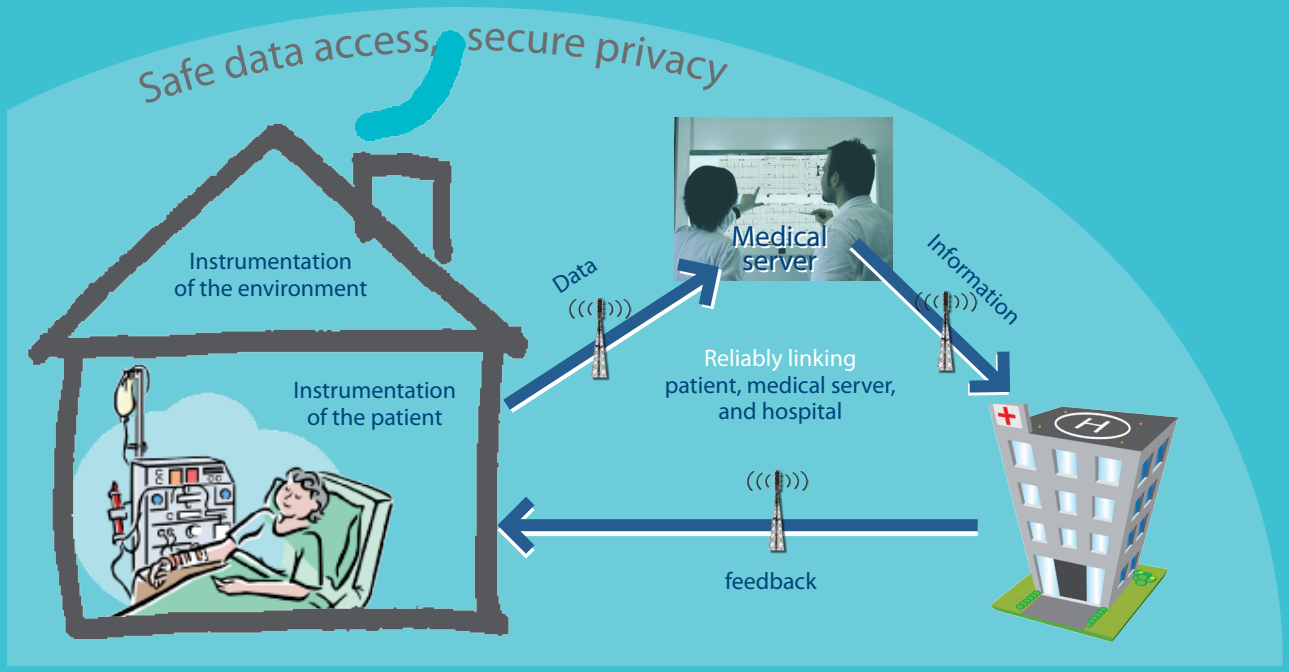
Fail safety - The overarching challenge of AA4R

The key targets of AA4R are to

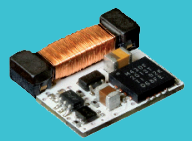
- provide correct services & provide services in correct way
- secure aggregation and evaluation of collected data
- ensure error management in hardware and software: detection, correction, recovery

Fail safety must crosscut through all layers of hardware and software

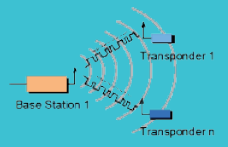
Human life is at stake ➡ Fail safety to sense, communicate, decide,verify, act, secure.




sensors & actuators

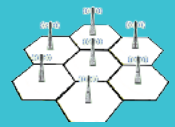

autonomous system


wireless transmission



scalable ICT architecture


fail-safe software


fault-tolerant networks

The interdisciplinary AA4R research program

Research areas

I Sensors and actuators
II Energy-efficient communication
III Autonomous systems
IV ICT infrastructures
V Medical device software
VI Medical cyber-physical systems