Gesunde Lebenswelten
EIN ANGEBOT DER ERSATZKASSEN

ROBUST

ROBUST – Social Robotics at the heart of care: Opportunities, Challenges, Risks

Jens Lüssem, Kiel University of Applied Sciences

David Unbehaun, University of Siegen

Hamburg, 26.09.2025

vdek Die Ersatzkassen
Forschungs- und Entwicklungszentrum Fachhochschule Kiel GmbH
DNZ Gesellschaft für digitalisierte und nachhaltige Zusammenarbeit
GFO Zentrum Attendorn Wohnen, Pflege & Wachkoma Franziskaner-Hof franziskanisch · offen · zugewandt
GFO Zentrum Drolshagen Wohnen & Pflege St. Gerhardus franziskanisch · offen · zugewandt
DIAKONIE NORD·NORD·OST Damit es dir gut geht.
Seniorenwohnanlage „Am See“
Diakonie Schleswig-Holstein
NGD Gruppe Norddeutsche Gesellschaft für Diakonie

Agenda

- Project profile
- Project goals and architecture
- (Some) Project results
- Opportunities, challenges, risks

Project profile

Project profile ROBUST

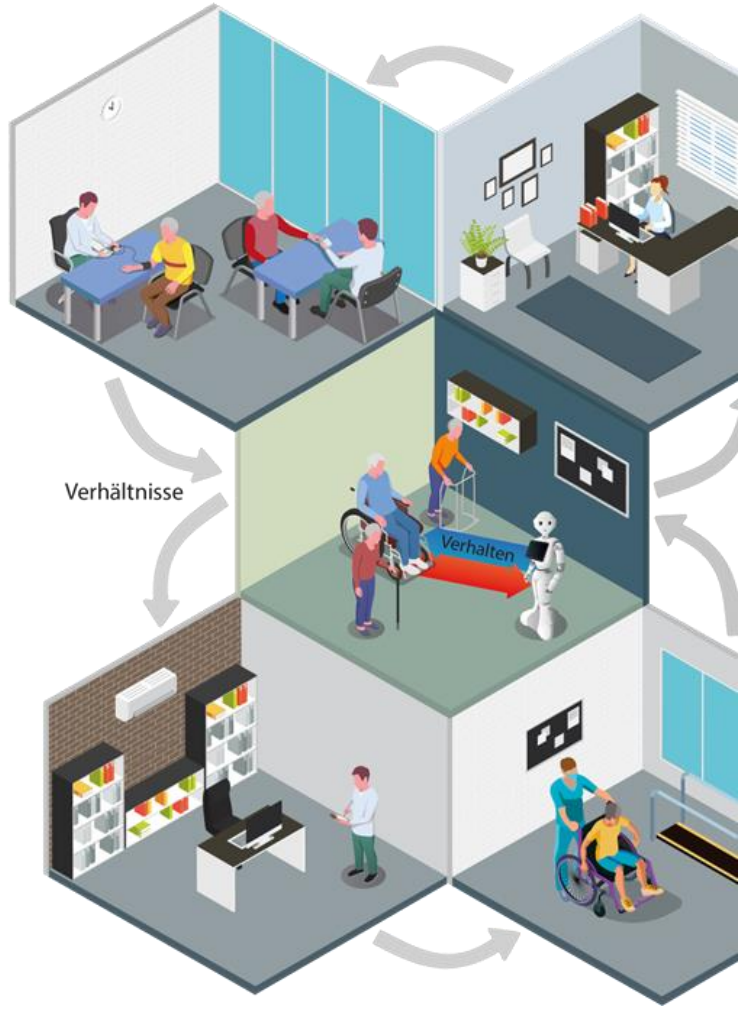
- Project funding: Association of health insurances (vdek)
- Duration: 3 years (2021 – 2024)
- Project partners: Kiel University of Applied Sciences, DNZ Siegen, Diakonie SH,
  4 care facilities (2 in Schleswig-Holstein + 2 North Rhine-Westphalia)

Project goals and project architecture

Robotics-supported digital prevention in inpatient care

- Health-promoting support of physical and cognitive activity of people in need of care through the socio-robotic system to be developed (**Verhaltensprävention**)

- Evaluation of structural effects and strengthening of the care facilities and actors involved in the project (**Verhältnisprävention**)



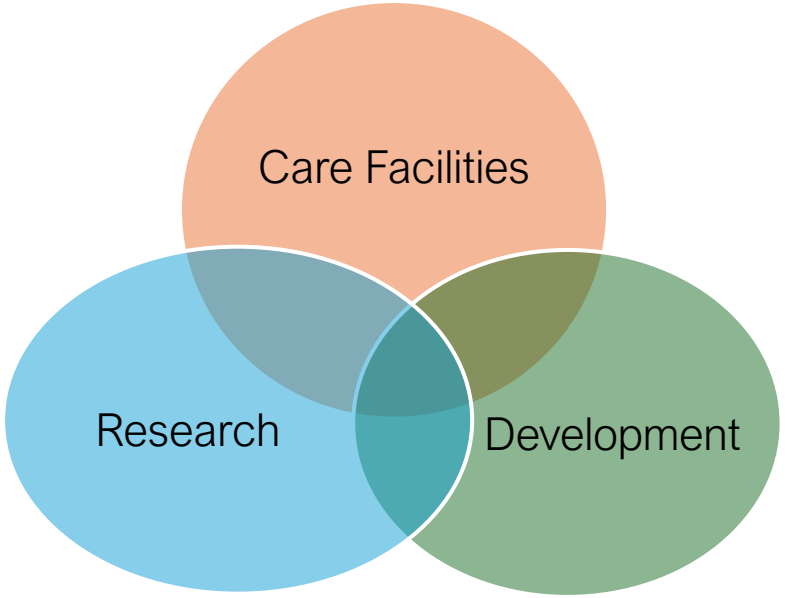
Key objectives and research questions of ROBUST

- Core objective 1: Strengthening Physical Health Resources
- Core objective 2: Strengthening cognitive health resources
- Core objective 3: Strengthening psychosocial health resources
- Core objective 4: Building the bond with health sports activity
- Core objective 5: Improvement of movement conditions

- Research question 1: What are the individual effects of preventive and participatory (to be developed robotics-supported) health services on people in need of care based on concrete use cases?
- Research question 2: What are the implications for the use and integration of the socio-technical system?
- Research question 3: What connections and interdependencies are there on health, behavior and relationships?

Internal Project Architecture

Project architecture has three interlinked areas



Participation, co-research and needs assessment:

- At the center: Residents (Behavior) and Facilities (Conditions)
- Focus: Contexts of use and practices in real-world scenarios
- Possibility of direct participation and needs-based development between end-users, academia and the relevant stakeholders
- Findings can be integrated into development in a timely manner

Guidelines for development

1. Guideline: Feasibility
   - Robots should be affordable
   - Robots should be easy to use (for nursing staff and residents)
   - Robots should assist, not replace (Intelligent Assistance Systems)

2. Guideline: Policy of small steps
   - Agile, small-step development
   - Development of small programs (apps)
   - Short development cycles

3. Guideline: Participation
   - Participation and co-development with
     - Nursing and care professionals
     - Residents and relatives

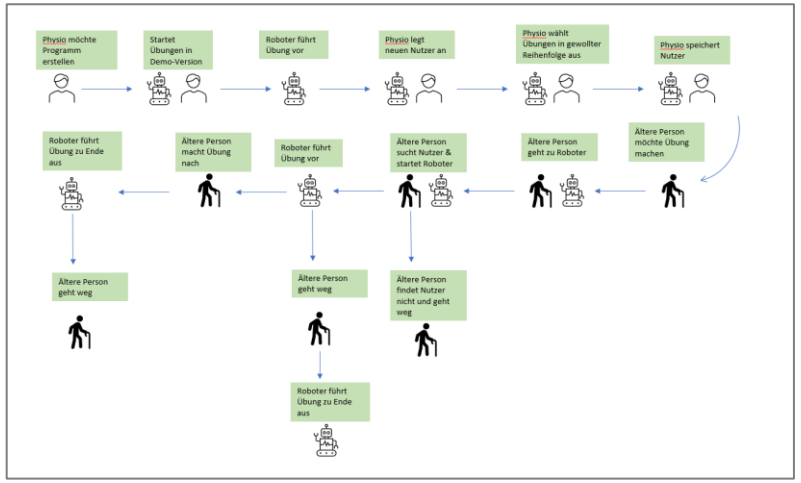
Methodology

- Mixed study design to investigate the appropriation, benefits and effects of the robotics-supported group offers for health promotion and prevention
- Establishment of *praxlabs* in the four care facilities for practice-oriented research and development in inpatient care facilities

Development steps – from idea to implementation

1. Brainstorming

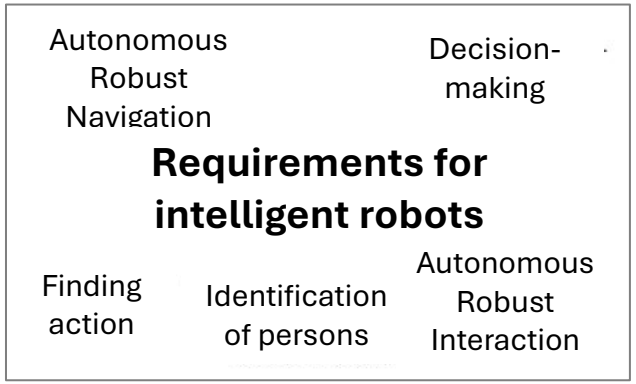
- Ideas are written down in the form of small stories



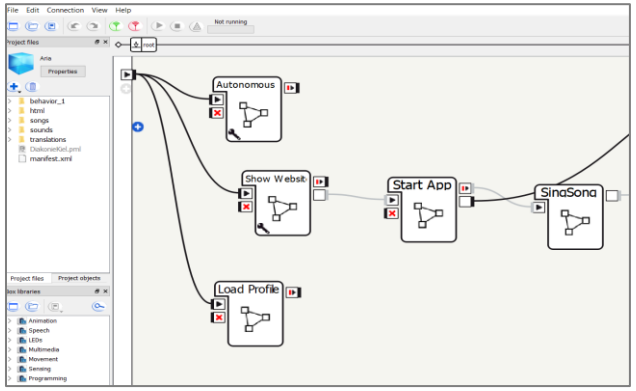
- Ideas are then shared
  - debated
  - checked for feasibility,
  - modified and supplemented

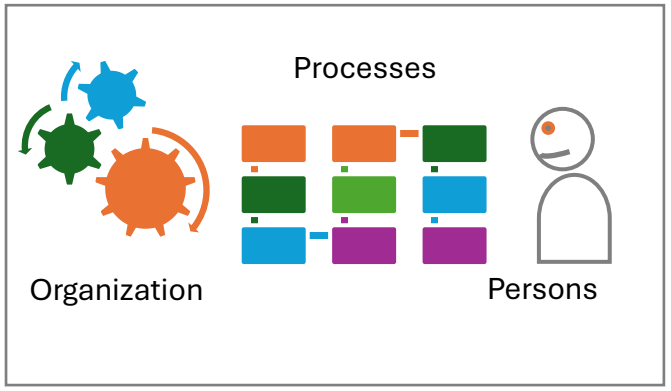
Development steps – from idea to implementation

2. Derivation of requirements



3. Implementation





Development steps – from idea to implementation

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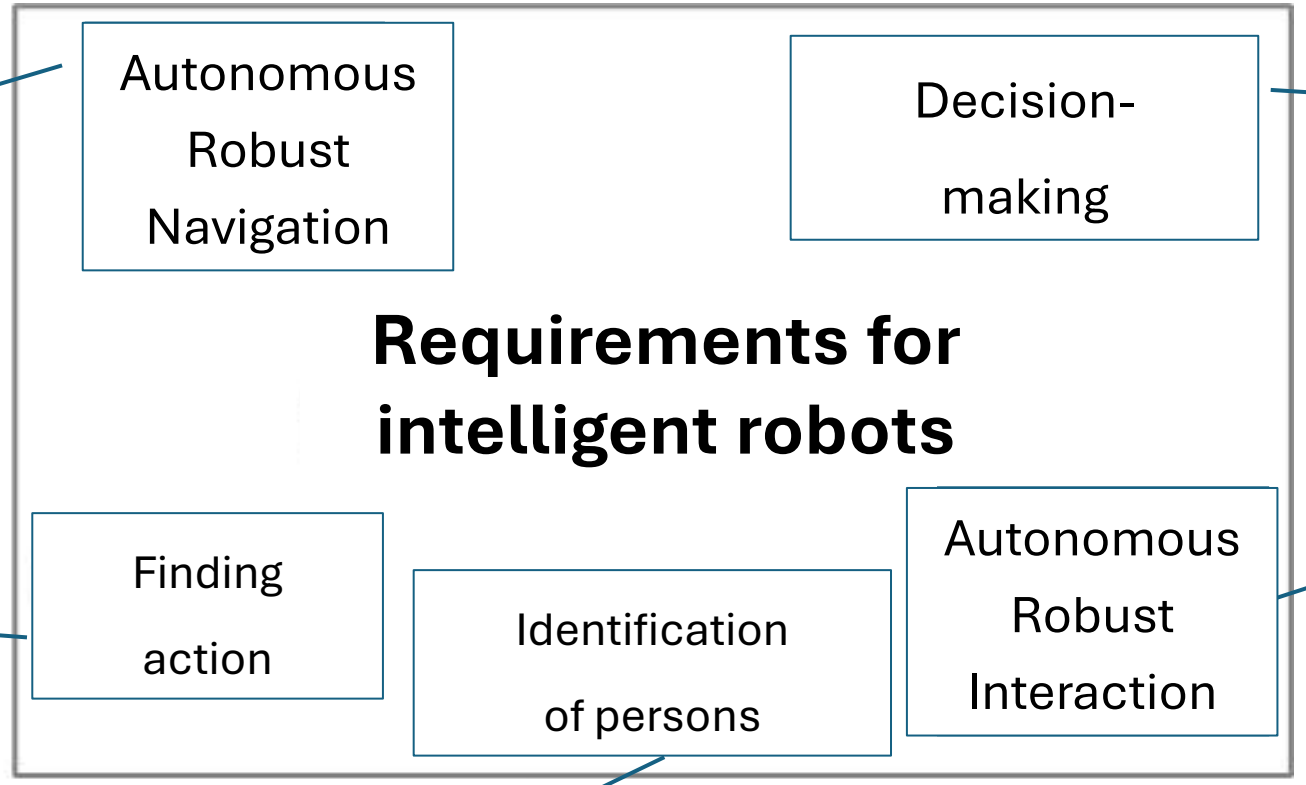


Standard procedures are sufficient. Own SLAM procedures were not used.

Simple procedures for decision-making are sufficient.

Simple procedures for finding action are sufficient.

Robustness of interaction problematic. Offering multiple interaction channels is required.

From a certain size, identification of persons is problematic for Pepper (storage space).

Development steps – from idea to implementation

4. Pilot operation on site

5. Assessment
   - Observations
   - Questionnaires
   - Interviews

6. Embedding in the weekly schedule
   - 3-4 group activities / week
   - Special Events

(Some) Project results

Demographic data (participants in the study phase)

Age and subjects per study group:

Group membership	Mean_Age	SD_Age	Min_Age	Max_Age	Subjects
Intervention group	80.83	13.80	50	101	N = 39
Wait list control group	80.42	11.11	51	91	N = 19

Core objective 1: Strengthening Physical Health Resources

- Physical activation was animated by the robot by means of movement exercises.
- Pepper as an additional exercise offer: Pepper's appearance alone motivates people to exercise

Measurement Physical Activity: Short Physical Performance Battery

Core objective 2: Strengthening cognitive resources

- Residents are mostly happy to receive the offers
- Cognitive and life history resources are activated

Measurement Cognitive Resources: Nuremberg Self-Assessment List (NSL)

Core objective 3: Strengthening psychosocial health resources

- Residents are cognitively stimulated, as well as socially and emotionally activated
- Attractive design by Pepper triggers joy among residents
- Pepper improves the atmosphere in the care facilities

Measurement Psychosocial Resources: UCLA Loneliness Scale

Opportunities

- Indications of reducing health risks
- Increase in physical and cognitive activation
- Reduction of loneliness experience

Challenges

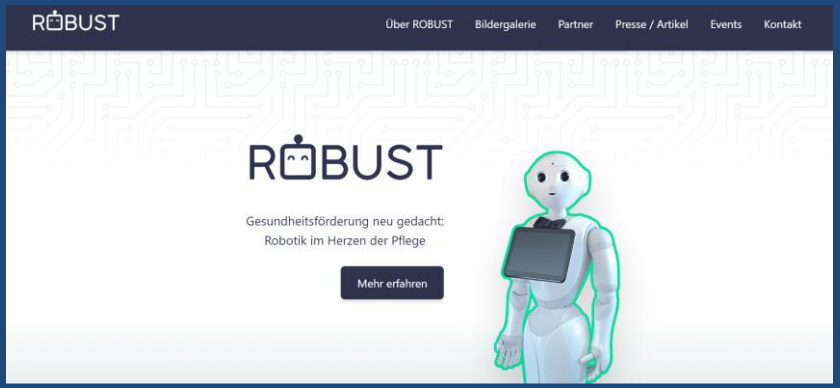
- Developing the professional skills of employees
- Sustainable implementation
- Data protection-compliant processing of (sensor) data
- Use of more complex algorithms / AI techniques has an impact on the robustness of the system

Risks

- Fears and anxieties of employees
- Lack of acceptance among employees and residents
- Willingness to change in terms of technology

Thank you for your attention!

Contact person at Kiel University of Applied Sciences
Prof. Dr. Jens Lüssem jens.luessem@fh-kiel.de



https://robust-vdek.de/