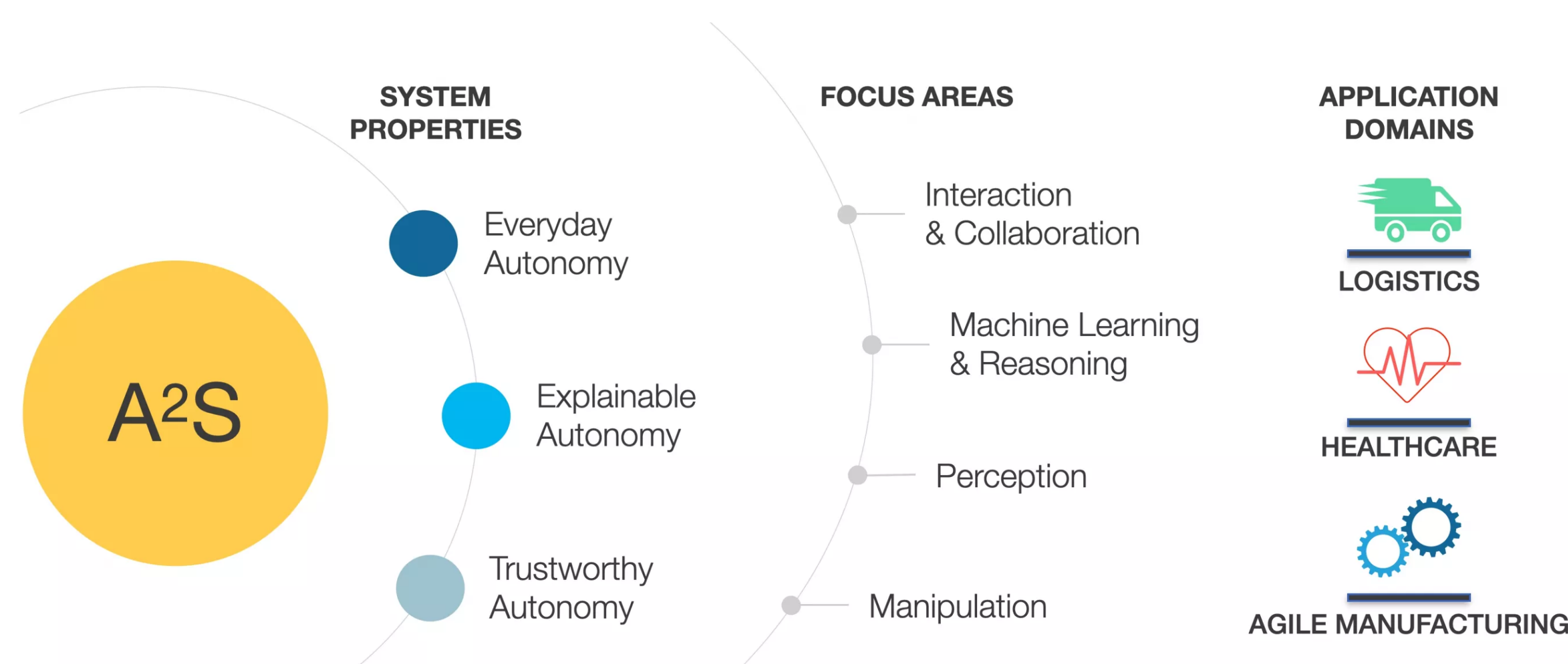


Research in the Institute for AI and Autonomous Systems (A²S)

Robotics, Machine-Learning, Human-Centered Autonomy

Focus Areas



PhD Research

Completed cooperative dissertations

- ▶ 2025: Iman Awaad (Osnabrück University): **Towards Autonomous Object Substitution by Domestic Service Robots**
- ▶ 2023: Alex Mitrevski (RWTH Aachen): **Skill Generalisation and Experience Acquisition for Predicting and Avoiding Execution Failures**
- ▶ 2018: Anastassia Kuestenmacher (RWTH Aachen): **Improving the Reliability of Service Robots in the Presence of External Faults**
- ▶ 2017: Nico Hochgeschwender (University of Luxembourg): **Model-Based Specification, Deployment and Adaptation of Robot Perception Systems**
- ▶ 2015: Azamat Shakhimardanov (KU Leuven): **Implementing Constrained Hybrid Dynamics using Semantic Models of Kinematic Chains**
- ▶ 2010: Ronny Hartanto (Osnabrück University): **Fusing DL Reasoning with HTN Planning as a Deliberative Layer in Mobile Robotics**

Ongoing Funded Projects

INNERVATE

Funding body: Federal Ministry for Economic Affairs and Climate Action (BMWK)

Objective: Develop a solution to automatically evaluate the quality of driver maneuver execution and to support drivers with information about the parts of the maneuver where they have made mistakes

Rhine-Ruhr Center for Scientific Data Literacy

Funding body: Federal Ministry of Education and Research (BMBF)

Objective: Support and promote researchers from a variety of research disciplines with regard to increasingly complex data analysis, data management and high-performance computing

Center for Assistive Technologies Rhein-Ruhr

Funding body: Ministry of Culture and Science of the State of NRW

Objective: Create a sustainable ecosystem for assistive technologies, encompassing infrastructure development, ethical considerations, public engagement, and financial sustainability

GARRULUS

Funding body: Ministry of the Environment, Nature and Transport of the State of NRW

Objective: Develop a fast, reliable, and cost-effective method for the reforestation and monitoring of damaged forest areas in Germany, using drones and artificial intelligence to target sowing at locations with the best conditions

Highlights of Completed Funded Projects

MigrAVE

Funding body: Federal Ministry of Education and Research (BMBF)

Outcomes:

- ▶ Prototype of a robot — using QTrobot and NAO — for the therapy of children with autism spectrum disorder (ASD).
- ▶ Evaluation of the prototype in a field study with 22 children with ASD.

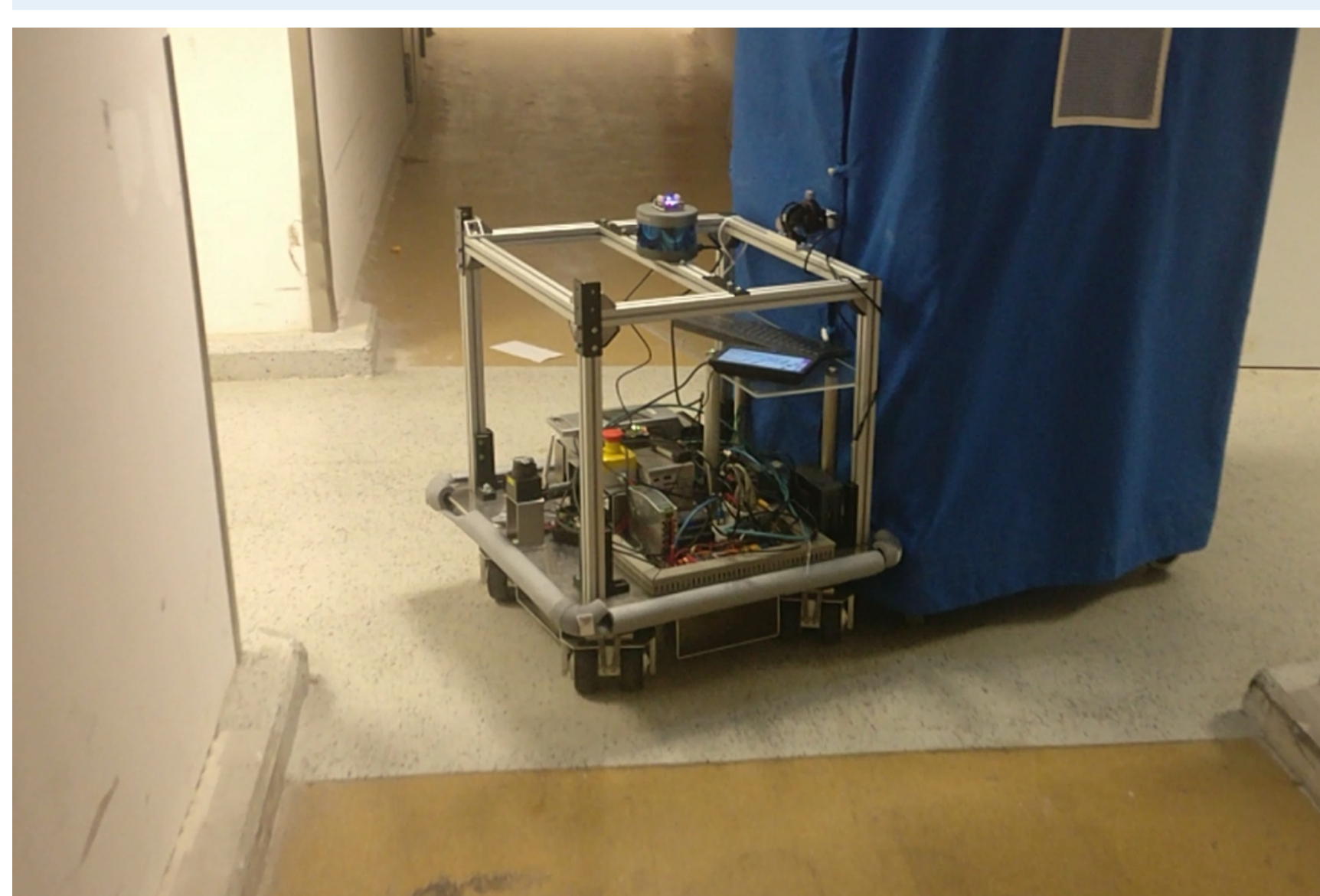


ROPOD

Funding body: European Commission (Horizon 2020 Innovation Action)

Outcomes:

- ▶ Prototype of a hospital logistic system that can perform tasks such as bed transportation and cart transportation.
- ▶ Concept for a novel type of wheel, further developed by KELO Robotics, a project spin-off company.



RoboLand

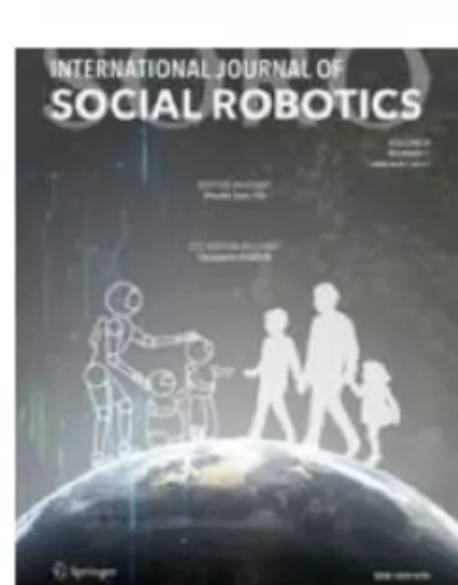
Funding body: Federal Ministry of Education and Research (BMBF)

Outcomes:

- ▶ Prototype of a telepresence robot — using Double and Amy — to enable remote support of elderly people with dementia.
- ▶ Deployment of telepresence robots in the houses of elderly people with dementia.



Common Publication Venues



Recent Co-Organised Workshops

Multimodal XAI workshop at
ACM ICMI 2024

Explainability workshop at
UbiComp / ISWC 2024

Execution failures workshop at
RSS 2024

PlanRob workshop at
ICAPS 2024

Execution failures workshop at
ICRA 2023

Contact

Institute for AI and Autonomous Systems (A²S)
Department of Computer Science
Hochschule Bonn-Rhein-Sieg
53757 Sankt Augustin, Germany
Email: robotics@h-brs.de

