

Research Center AI, Software and Safety

RESEARCH CENTER AI, SOFTWARE AND SAFETY



FOAIS Evolution

- > 2009 „Vienna Institute for Safety and Systems Engineering“
 - > Functional Safety and System Safety
 - > Inherent System Safety

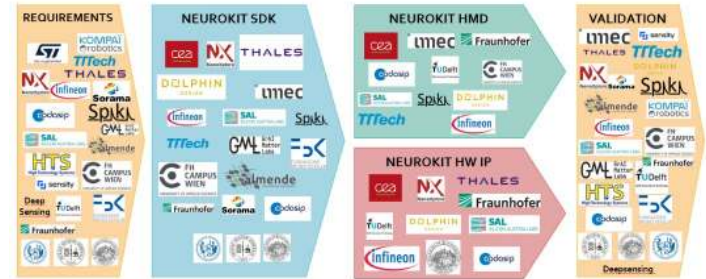
- > 2022/08 integration into the faculty Computer Science
 - > Expansion of research area to include **AI, IoT** and **Software**
 - > **„Research Center AI, Software and Safety“**

FOAIS Current Main Research Topics

- > Autonomous Railway Operations
 - > People Mover (Neurokit2E, TARO)
 - > Sensor Systems (iLIDS4SAM)
- > Embedded AI & Safety (Neurokit2E, SensoGrip)
- > AI & XR
 - > AI & XR Lab, Endowed professorship
- > Resilient Infrastructure / Smart Villages
 - > Internet of Things
 - > Resilient community management (climate change, disaster control)
 - > Research cooperation with municipality of Neuhaus
- > Interdisciplinary Software Projects (e.g. Guide2Care)
- > Serious Gaming (e.g. EthiCare)

NEUROKIT2E

- > Open-Source Deep Learning Platform dedicated to Edge/Embedded AI
 - > HORIZON-KDT-JU-2021-2-RIA
 - > 27 participants, 22M€ budget
 - > FOAIS 355k€
- > Project duration 06/2023-05/2026



<https://neurokit2e.eu/>

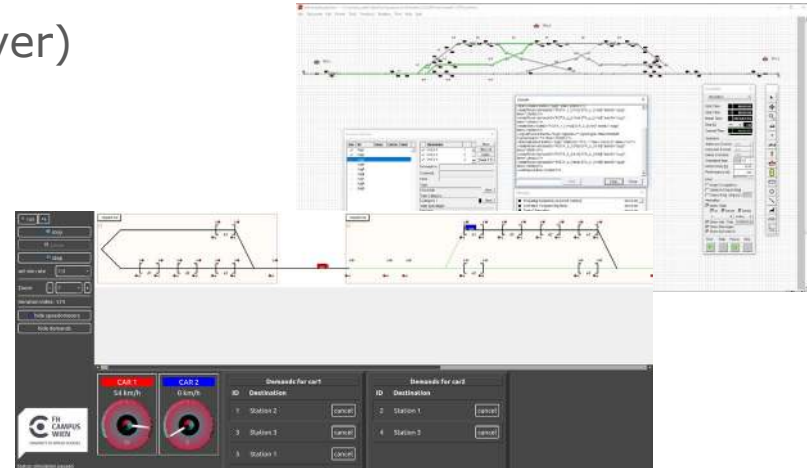
- Develop a unified and versatile SDK and hardware modelling framework
- Innovative, hardware-aware, machine learning optimization techniques
- Low-cost specialized hardware generation
- Reunite deep learning and **neuromorphic**
- **Embedded neuronal networks for usage in safety-critical environments**

Towards Automated Railway Operation (TARO)

- > Creating a digital model of the rail infrastructure.
 - > Single-track secondary railway lines
 - > Small, flexible rail cars (People Mover)
 - > On-demand Mode
 - > 24/7 Operations
- > Completed 12/2023



RECHENRAUM
EATING 3D/CAD/CAM SOFTWARE



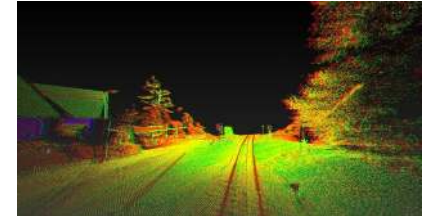
[YouTube TARO: Digitaler Zwilling Infrastruktur](#)

iLIDS4SAM

iLIDS4SAM
Integrated LiDAR Sensors
for Safe & Smart Automated Mobility



- > Integrated LiDAR Sensors for Safe & Smart Automated Mobility
 - > Safety analysis of critical traffic situations with autonomous vehicles
 - > Definition of requirements for safe sensor systems for autonomous driving
 - > Generation of safety proof in defined use cases
 - > Exploit synergies for the people mover concept
- > Completed 12/2023



<https://www.ilids4sam.at/home>

Smart Village Neuhaus

- > Resilient infrastructure
- > Ensuring security of supply despite climate change
- > Budgetary and staffing constraints add to challenges for small communities.
- > ARGOS: monitoring solution for water supply operation
 - > Real-Time water balance reports
- > ML models for anomalie detection
- > Winter service



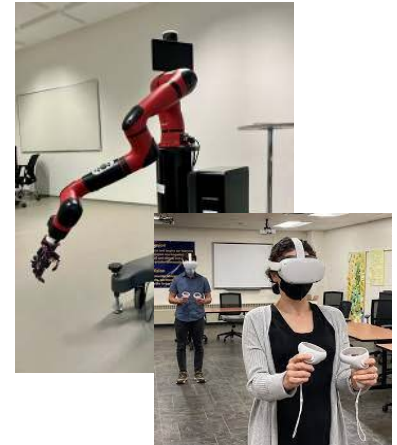
Interreg Project KaraMON

- > Resilient infrastructure through digital innovation
- > Start planned 12/2024



AI & XR Lab

- > Enables interdisciplinary research
- > In cooperation with other departments
- > Close integration into study programmes
- > Project duration 10/2021 - 09/2026



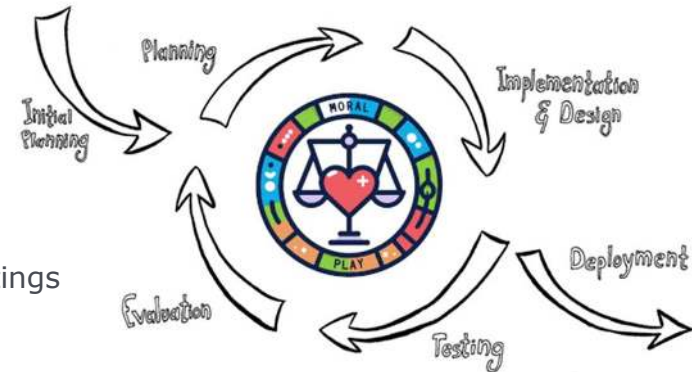
Guide2Care

- > Development of a digital platform that offers healthcare professionals and caregivers convenient access to evidence-based knowledge to enhance care quality.
 - > Cooperation with Center for Applied Nursing Research
 - > Project budget 490 k€ (MA23 funding rate 80%)
 - > FOAIS 294k€ / ZAP 196k€ (235k€/156k€)
 - > Project duration 01/2025 - 12/2028
-
- Evidence-based knowledge: offers up-to-date nursing knowledge digitally.
 - Target group: Healthcare professionals and laypersons in need of care
 - User-friendly: Cross-platform web app with search and bookmarking features.
 - Quality improvement: Enhances professional development and care quality.



EthiCare: Play Serious – Act Moral

- > Development of a Serious Moral Game for Ethical Competence Acquisition in Nursing Education
 - > Cooperation with Center for Applied Nursing Research
 - > Project budget 385k€ (MA23 funding rate 80%)
 - > FOAIS 186k€ / ZAP 199k€ (149k€/159k€)
 - > Project duration: 01/2025 – 01/2028
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- Praxisnahe Problemstellungen – Fallbeispiele aus pflegerischen Settings
 - Einbettung in ein didaktisches Konzept
 - Einsatz und Evaluation in der Lehre



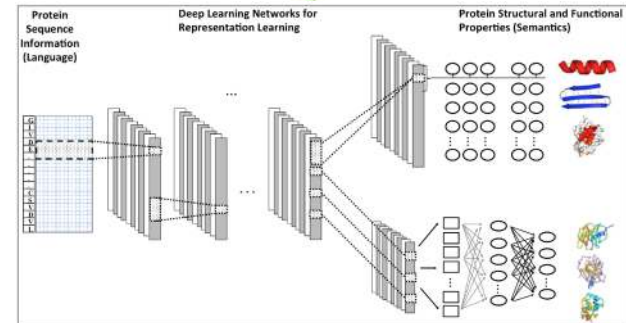
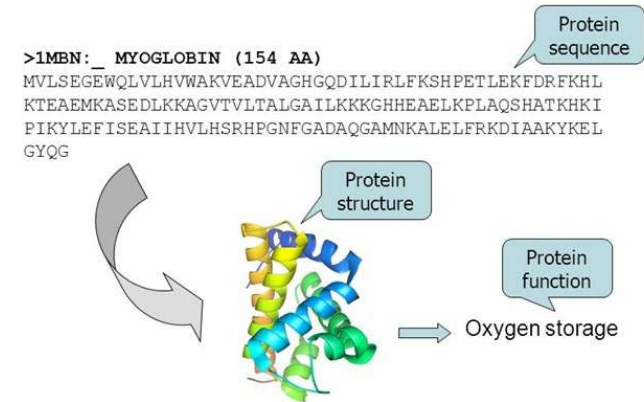
Grip'n'Play

- > Serious Games for training pencil grip and control to support children in primary school in learning writing skills.
- > SensoGrip System to be further developed within the project
- > Games developed based on Game Mechanic Models and the Gamification Framework "Octalysis."
- > In Cooperation with Digital Health and Care



Protein structure and function prediction with Deep Learning

- > Cooperation with MedUni Vienna
- > Prediction of protein structure and function using DL
- > Combination of in vitro and in silico methods through collaboration with molecular biologists
- > Visualization using virtual reality





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