WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WASP Research Arena (WARA)

Community Building Summer School 2026





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WARA: The Mission

> Increase the value and relevance of research by strengthening and promoting collaboration between WASP researchers and industry partners.

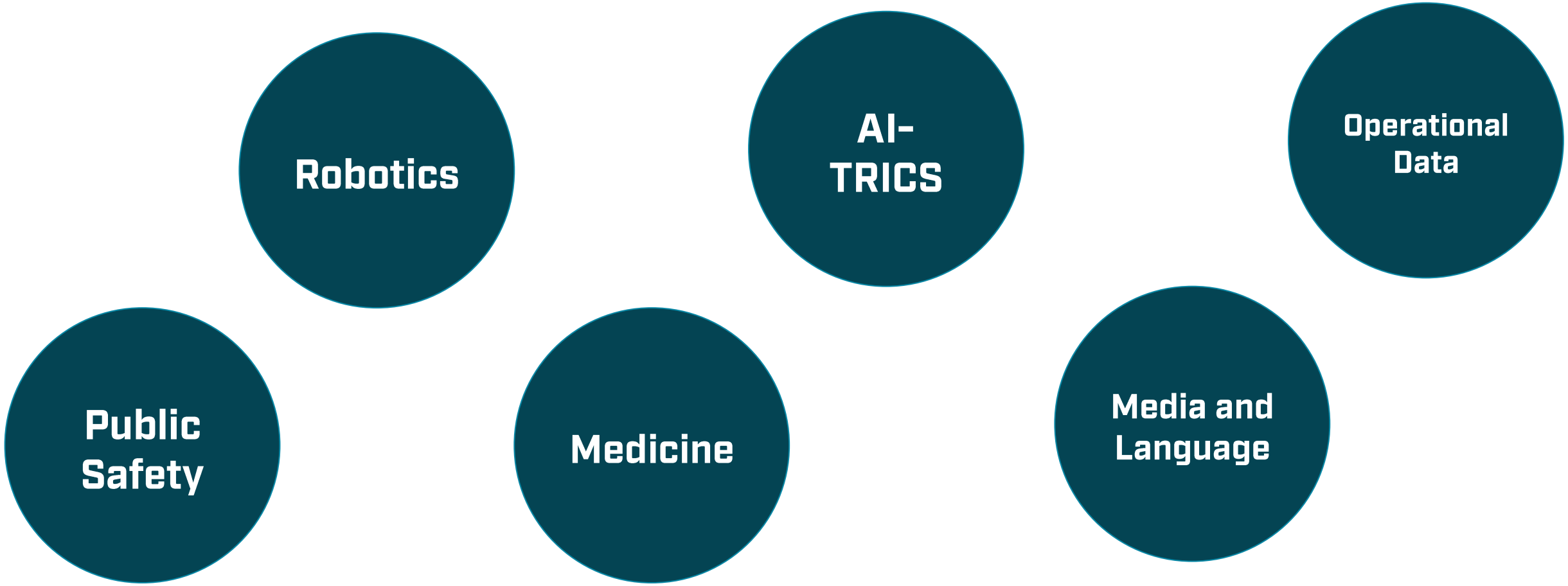
Read more:



Photo: Thor Balkhed, Linköping University

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WASP Research Arenas



Value of engaging in WARA

For WASP PhD students

- Validate the potential of your research results, improve academic impact, learn from field, and establish new ways for feedback
- Gain access to state-of-the-art resources.
- Use the possibility to inspire others, to make impact in the society and in the future world
- Grow your network with others in the WASP community and Swedish industry.
  You may find your future career!



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WARA Robotics: Mission

- **Bring together** research community from **industries and academics** to solve future robotics application challenges
- To **create competence and research** in artificial intelligence and autonomous systems for the benefit of Swedish society and industry



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SICK
Pick Nick
SICK
SICK
KQ06-1
KZ06-1
KZ06-2
KZ06-4

Partners Constellation

WASP Universities

CHALMERS UNIVERSITY OF TECHNOLOGY

KTH VETENSKAP OCH KONST

LUNDS UNIVERSITET

UMEÅ UNIVERSITET

LINKÖPING UNIVERSITY

UPPSALA UNIVERSITET

Centers of Excellence

ÖREBRO UNIVERSITET

LULEÅ UNIVERSITY OF TECHNOLOGY

Academic Collaborations

Academia

Partners

ABB Robotics

VOLVO

Algoryx

ERICSSON

Members

SICK Sensor Intelligence.

SCHUNK

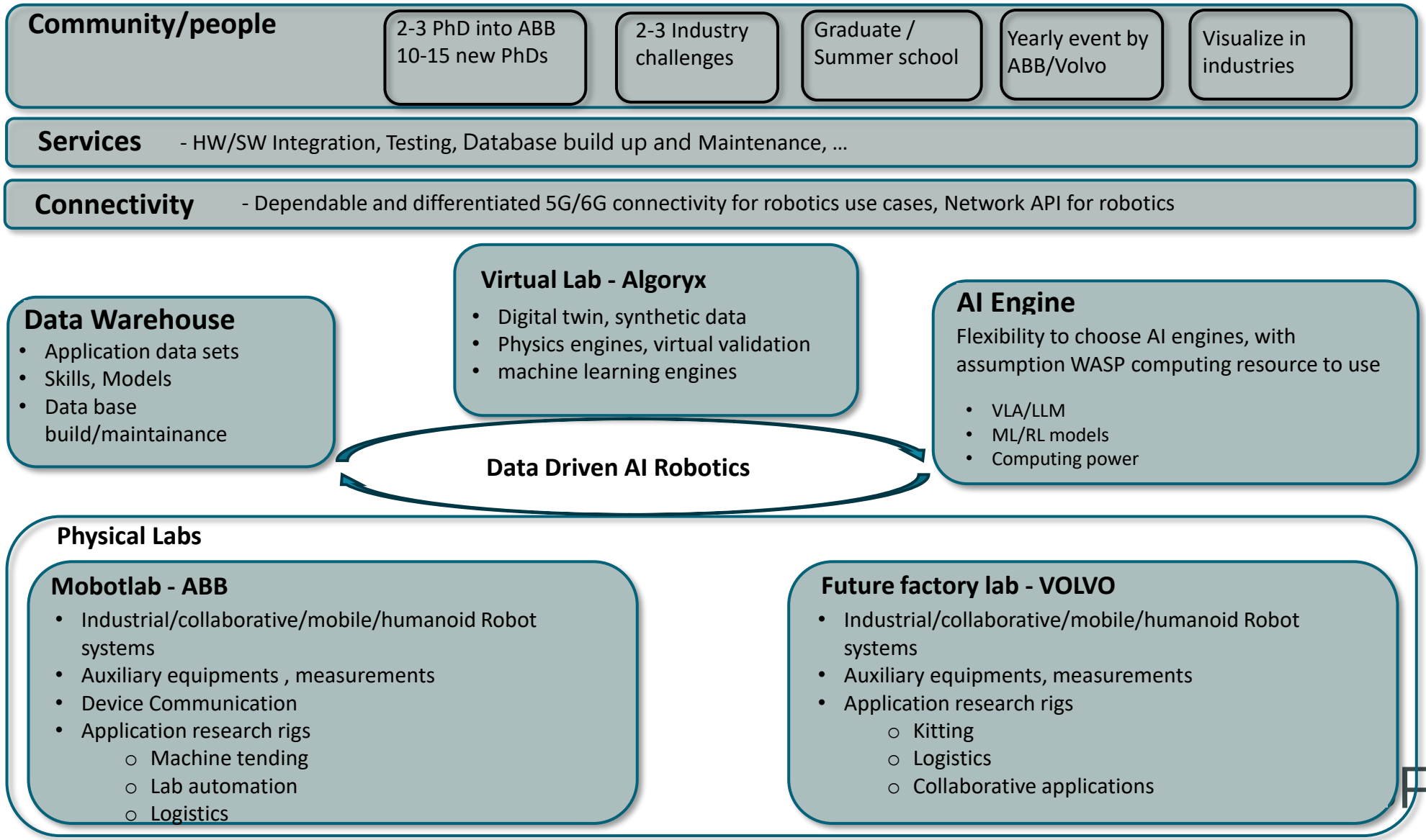
AstraZeneca

Industry

WARA ROBOTICS

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WARA Robotics: Plans 2026-28



WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WARA Robotics: offering at ABB Robotics Site

Robots



Control Interfaces



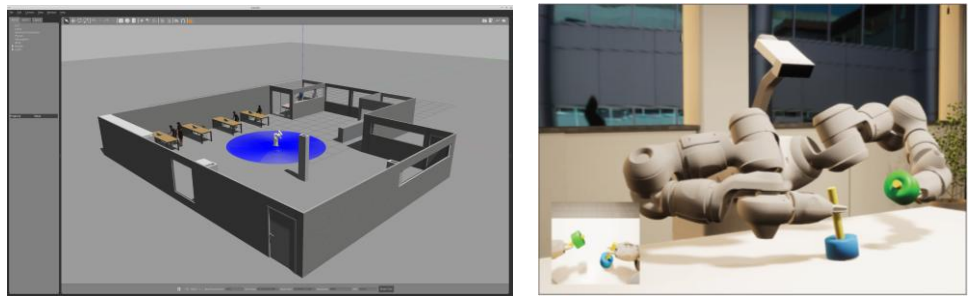
Robot AI model teaching package



Use Cases: Lab Automation



Digital Lab



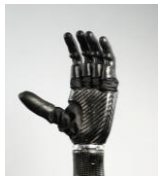
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WARA Robotics: Data Collection Pipeline

Robot AI model teaching package







Use Cases




External PC

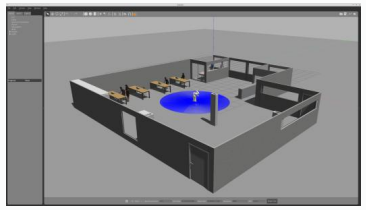


- Interface to robot & grippers (RWS, EGM, ROS)
- Data transformation into common formats

Teaching aids

- Estimation of necessary demonstrations
- Data quality score (diversity)
- Demonstration progress bar

Digital Lab

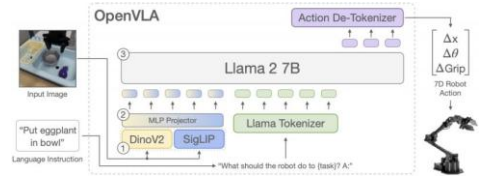



GAZEBO

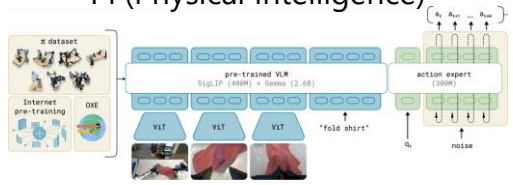
AGX DYNAMICS for UNREAL

VLA models (selection)

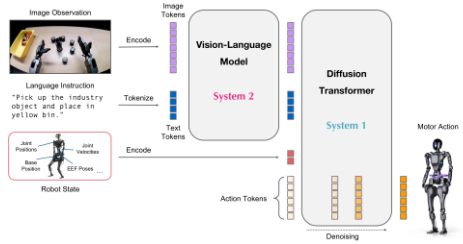
OpenVLA (research, open-source)



Pi (Physical Intelligence)



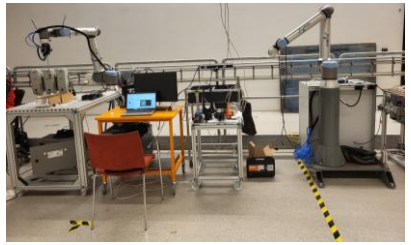
GR00T (NVIDIA)

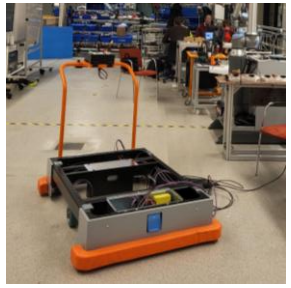


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WARA Robotics: Offering at VOLVO Site

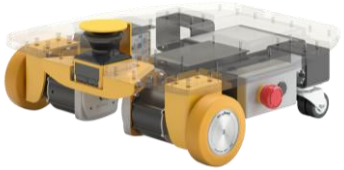
Robots/grippers







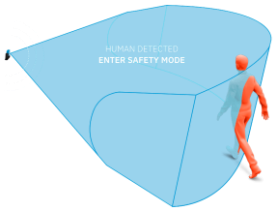




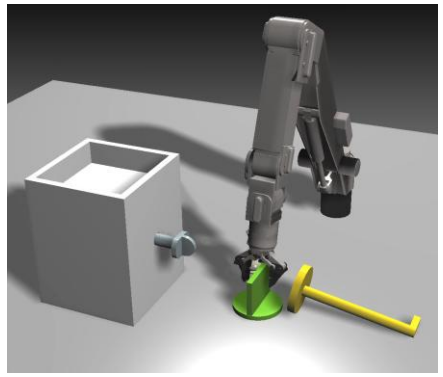
Control, sensors and Data



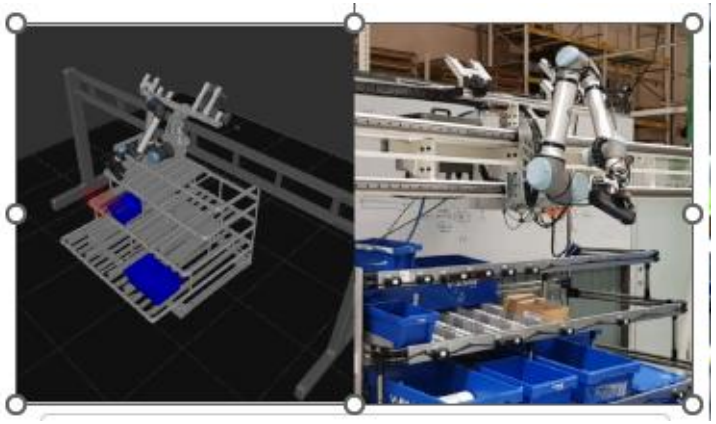




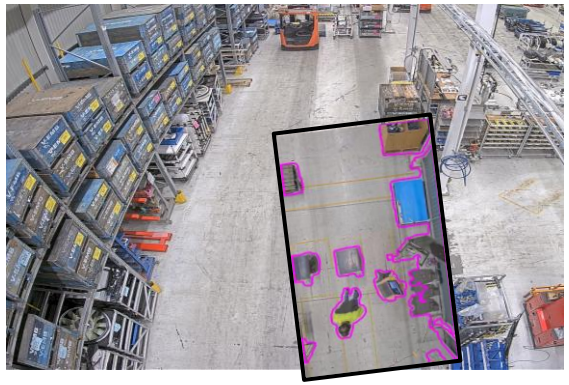
Virtual AI models and models for AI training



Lab Use Cases: Internal Logistics



Plant deployments:





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Robot Manipulation Challenge 2026

Material handling/Kitting use-case from Volvo

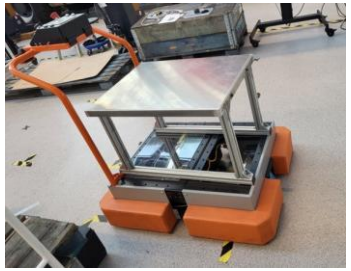
Step 1
- GPSS robot navigates adjacent to the picking place
  - Dynamic convex obstacle handling

Step 2
- GoFa pulls out a drawer
  - Contact rich manipulation

Step 3
- GoFa picks up and places a part on the GPSS robot
  - Contact rich manipulation, VLA/model training







→ Collaboration with Volvo Trucks

→ 8 teams show interests to join

→ Digital twin from Algoryx, Data collection from ABB Robotics, final deployment to Volvo Trucks in December.

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WARA | MEDIA & LANGUAGE

WARA Media and Language is the research arena dedicated to scientifically excellent work on AI for the creation, interaction with, and consumption of media in a broad sense, frequently in real time.

This has relevance to application areas such as **news media**, **digital didactics**, **game development**, **human-agent interaction**, **information-dense industrial settings**, and **academic research**.

The arena connects academic research and industrial practice, enabling a bidirectional exchange of challenges, resources, and knowledge.



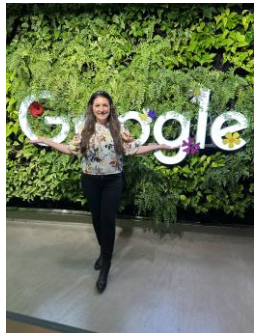
Photo: Peter Karlsson, Svarteld foto & form AB

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WARA | MEDIA & LANGUAGE

Networking and collaboration opportunities:

- Research retreats
- Study visits
- Community Days
- Summer schools
- Webinars
- Workshops











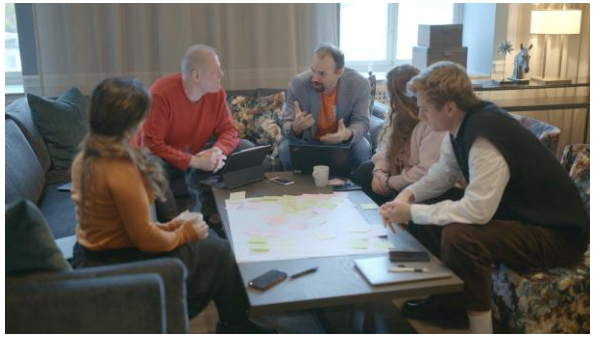




Photo: Peter Karlsson, Svarteld foto & form AB

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WHO'S ALREADY HERE

A growing partner network

Academic, industrial and public-sector partners already active in the arena.

INDUSTRY PARTNERS

Electronic Arts · NVIDIA · Bonnier · SoftServe · Ericsson · Modda · Parsd

Deeptensor · Sparsit · FairAIData · Voyado · Orb DB · AllEars

Thecca · King · AWA · Codemill · Aeterna Labs

PUBLIC SECTOR & NETWORK PARTNERS

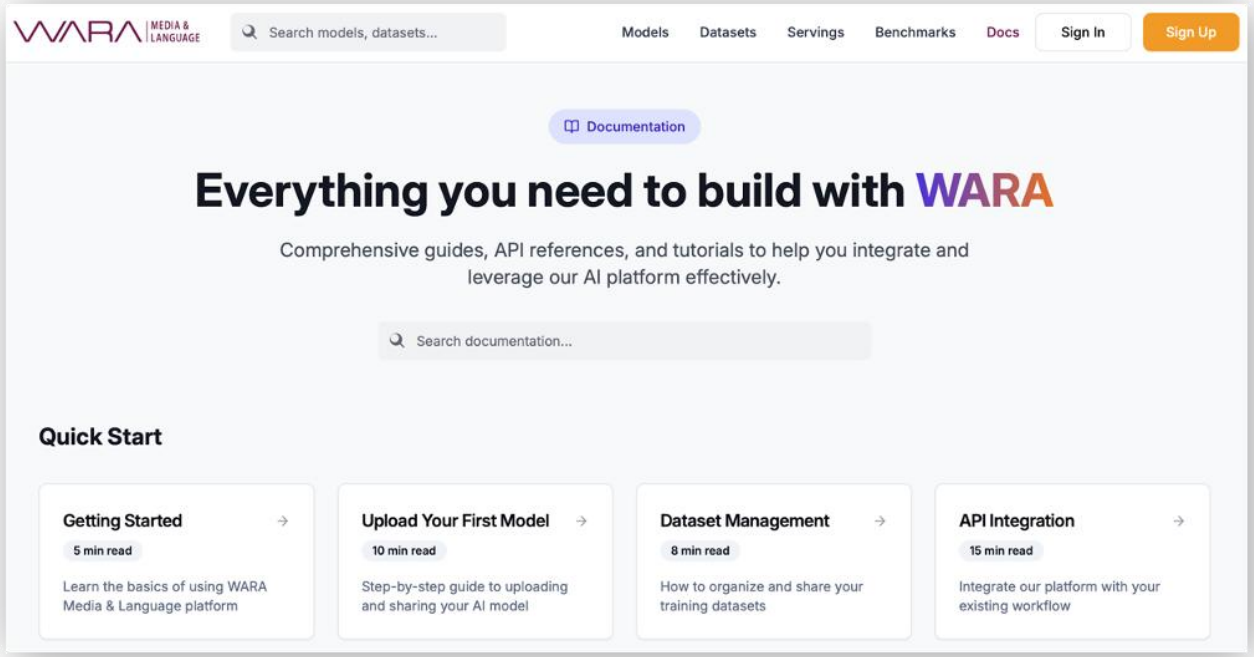
WASP-HS · The National Library

The National Archives · Region Sörmland



WARA MEDIA & LANGUAGE

A Collaboration-Ready Workbench for Media AI



- Template legal agreements
- Legal support
- Dynamic access control
- Models
- Datasets
- Servings / Integration points
- Benchmarks
- Developer support
- *Annotation / Data Collection*
- *Data synthesis*

Photo: Peter Karlsson, Svarteld foto & form AB

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WARA MEDIA & LANGUAGE

An emotion-aware, multilingual avatar assistant for real-time human interaction.



Photo: Peter Karlsson, Svarteld foto & form AB

Interactive AI Avatar – Jade

A USD-based 3D character that listens, speaks, and reacts with life-like facial animation.

Real-Time Voice Interaction

Low-latency ASR and streaming TTS for natural, spoken back-and-forth conversation.

Emotion-Aware Responses

Six emotion tags (happy, angry, calm, fear, neutral, sad) drive both voice tone and face.

Audio2Face + Audio2Emotion

Voice is rendered into precise lip-sync and expressive facial motion on the fly.

Multilingual (EN / SV)

First-class support for English and Swedish, with per-language voices and prompts.

GraphRAG Knowledge Base

Answers are grounded in a GraphRAG-powered knowledge base for accurate, domain-aware replies.

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WARA | MEDICINE

WARA Medicine serves as a collaborative platform where Swedish academia unite with the pharmaceutical industry to conduct pioneering research. The research arena will strengthen the entire pharmaceutical value chain, from drug discovery and development to manufacturing, supply chain optimization, and commercialization.



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WARA | MEDICINE

The questions that should keep us working together

Better medicines are not one problem. They are a connected system of problems.

01 **Do we have medicines for all diseases?**
Unmet needs remain where biology, evidence or incentives are difficult.

02 **Are medicines affordable enough?**
Discovery, development and production choices shape total cost.

03 **Are medicines accessible to everyone?**
Availability depends on robust production, supply and delivery.

04 **Can we respond faster to new diseases?**
Speed requires reusable data, methods, infrastructure and trust.



WARA Medicine helps researchers work on the connections between these questions.

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WARA | MEDICINE

From excellent research to pharmaceutical impact

WARA Medicine connects problems, people, data and environments.

GROUND	Important industry and healthcare challenges
CONNECT	The disciplines the problem actually needs
TEST	Relevant data, infrastructure and environments
TRANSFER	Evidence, assets and learning across organizations



Researchers bring the hypotheses, methods and imagination.

The arena helps aim, combine and validate them.

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WARA | MEDICINE

The solution will be a combination of ideas

No single discipline, model or organization spans the whole challenge.



AI & ML

models and uncertainty

Life science

biology and mechanisms

Engineering

automation and scale-up

Data

quality and governance

Clinical

patients and evidence

Human systems

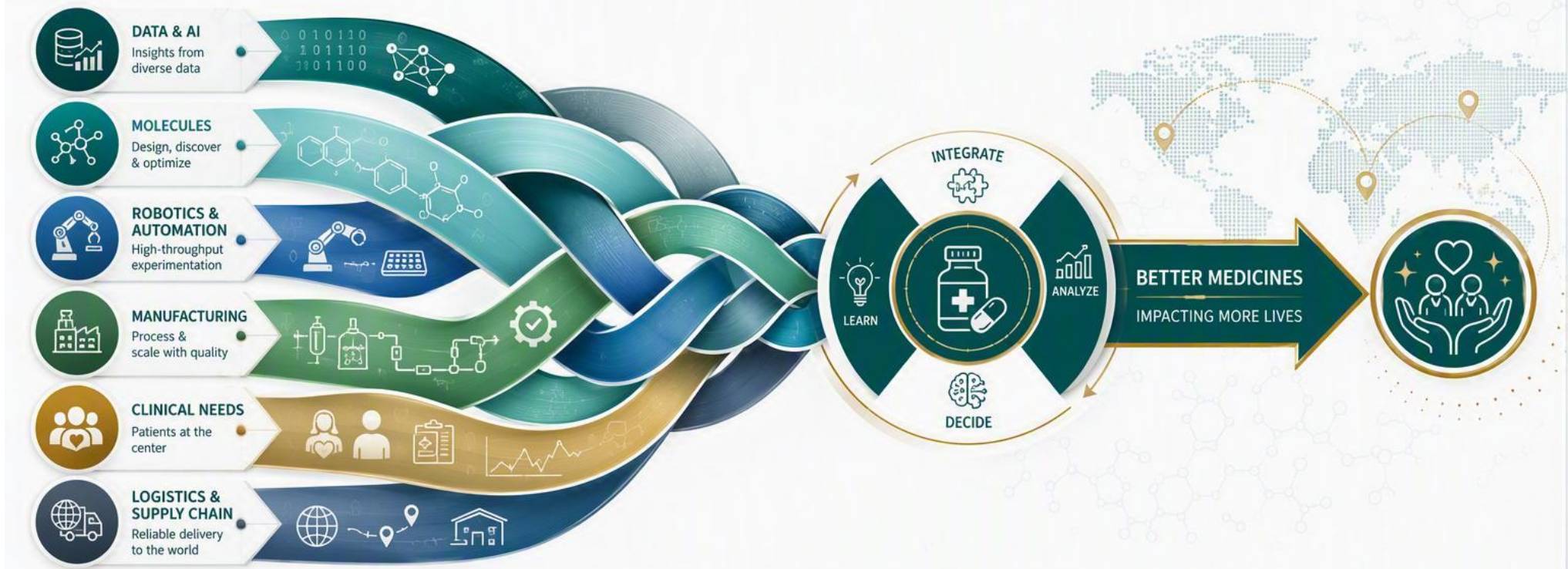
workflow, trust and adoption

Bring a method that needs a challenge, or a challenge that needs new methods.

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WARA MEDICINE

BRAIDING DISCIPLINES. DELIVERING BETTER MEDICINES.





ACADEMIA & INDUSTRY
Stronger together.
Innovation without borders.

OPEN COLLABORATION
Share knowledge.
Accelerate discovery.

TRUST & ETHICS
Responsible AI.
Patient privacy.

DIVERSITY & INCLUSION
Different perspectives.
Better solutions.

GLOBAL HEALTH IMPACT
Science for people.
Health for all.

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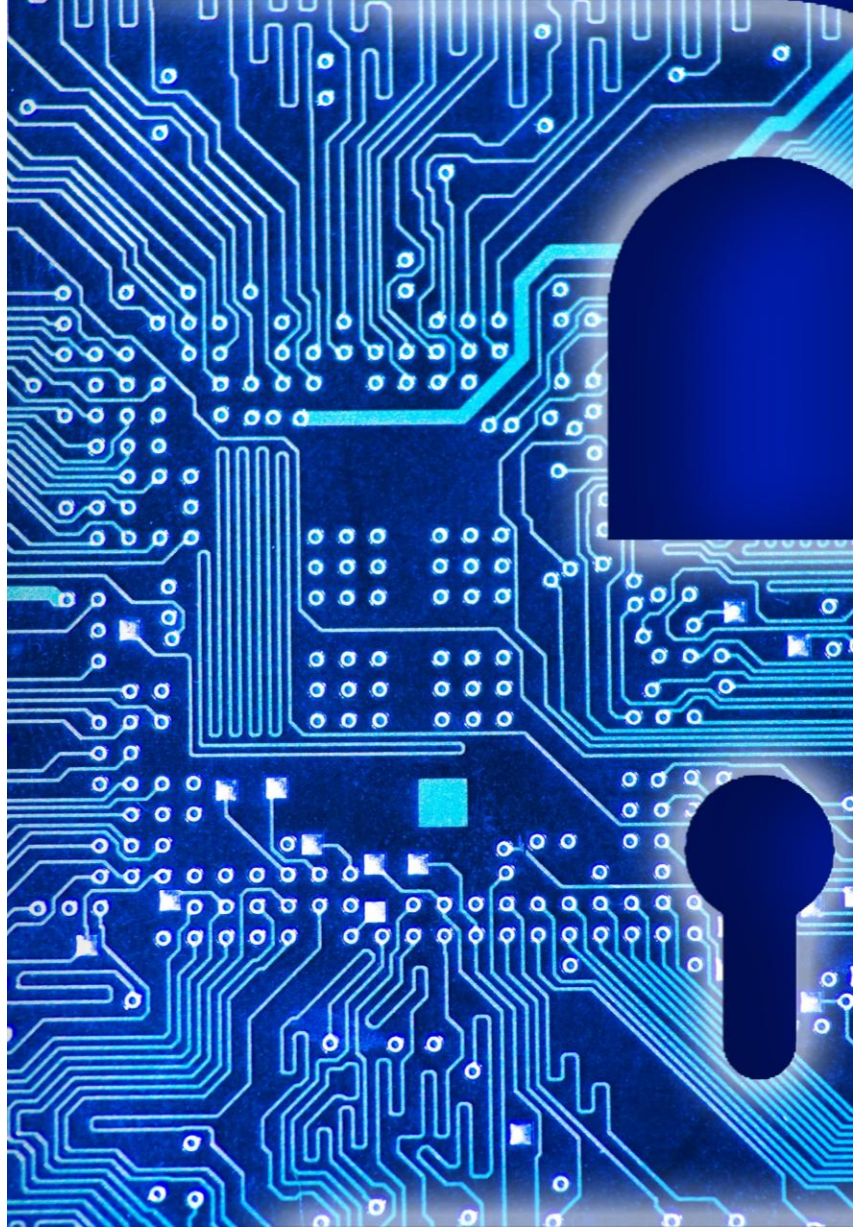
WARA | MEDICINE



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WARA | OPERATIONAL DATA

WARA OPS seeks to bring together Swedish industry and academia to solve state-of-the-art challenges in data-driven operational research. It develops an advanced data storage and processing infrastructure enabling users to interactively store, annotate, process, and visualize large operational datasets.



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WARA | OPERATIONAL DATA

Partners

Ericsson, SAAB Naval, European Spallation Source (ESS), Tieto, Digital Futures@KTH

Services

WARA-Ops is a service to support a research community around operational data from all kinds of critical live systems, such as:

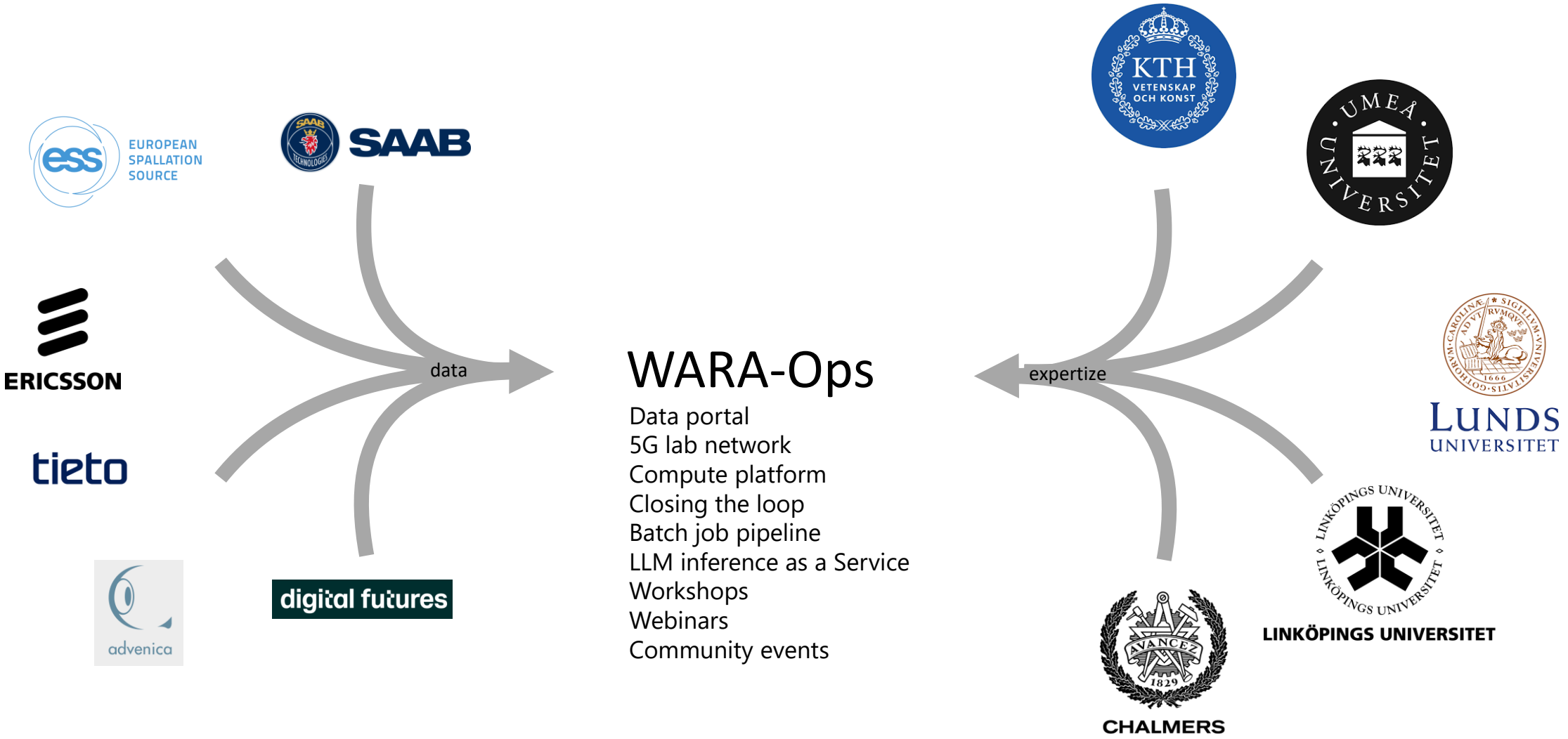
- Communication systems
- Energy management
- Control systems

The goal is to achieve high resilience, be able to facilitate predictive maintenance, high uptime, e.t.c.

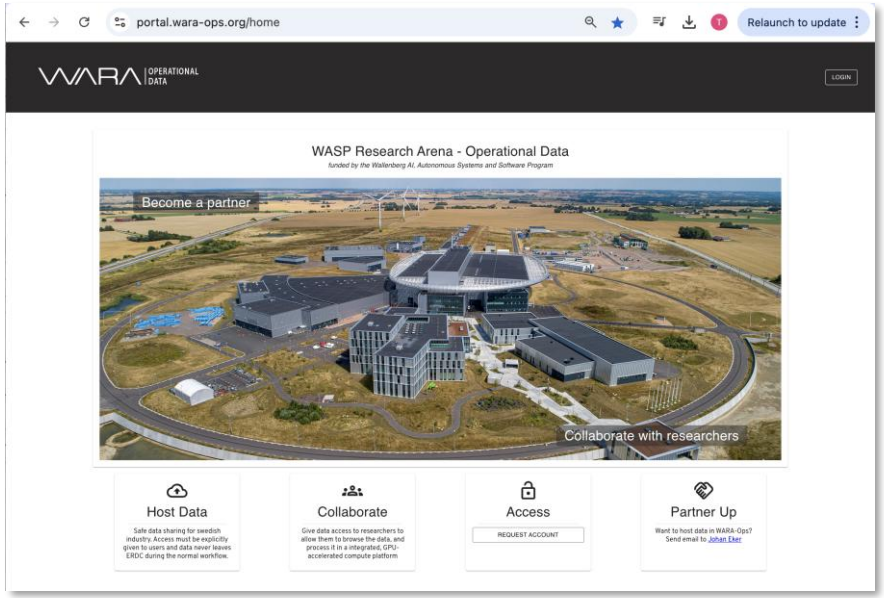


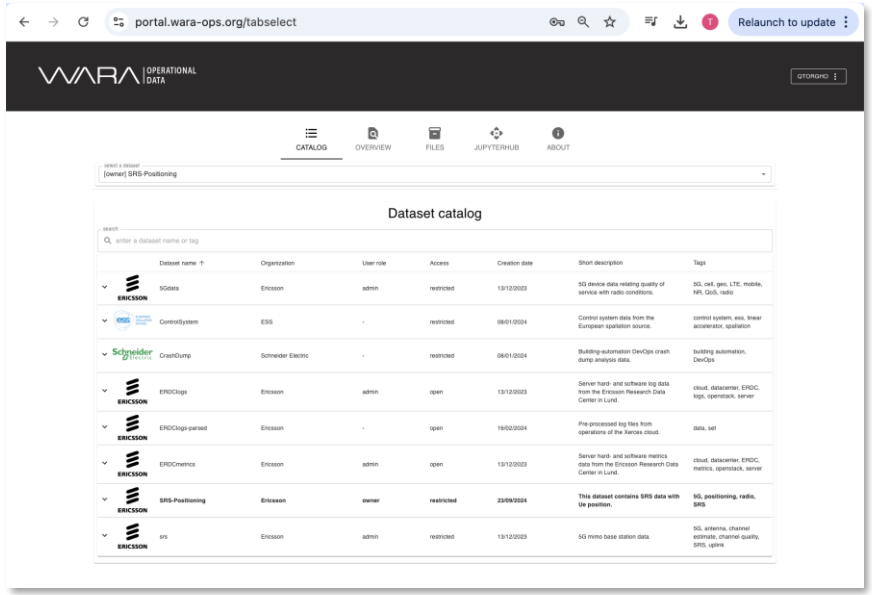
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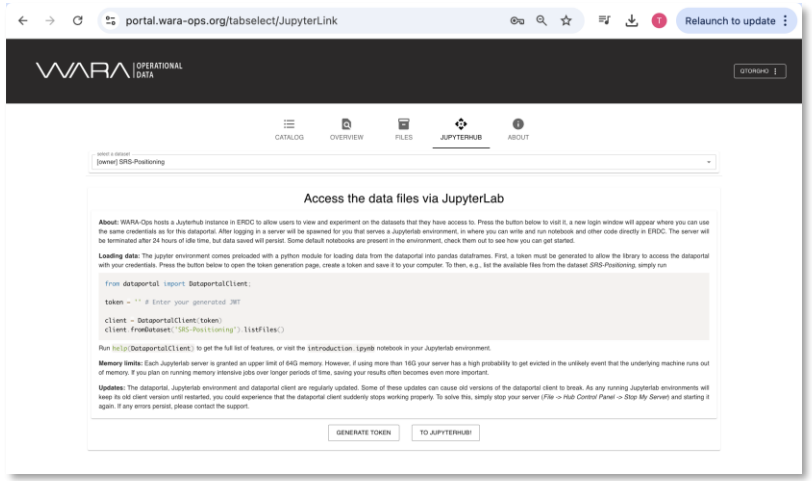
Bringing people together

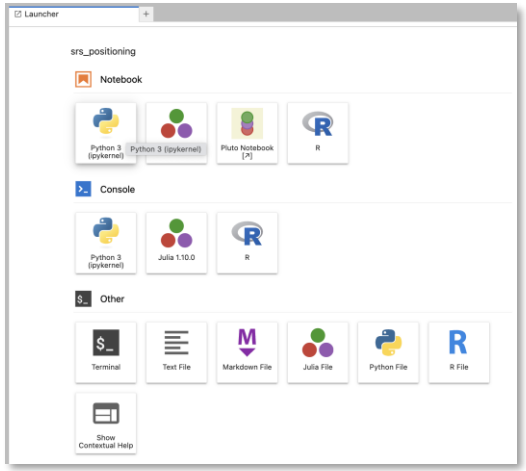


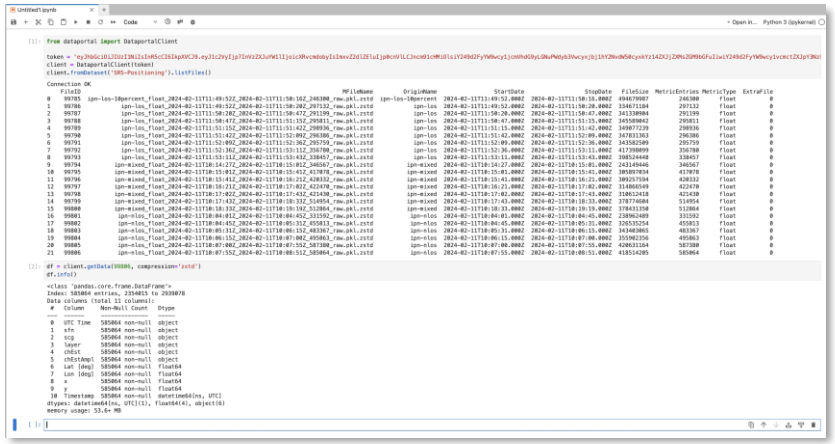
The WARA-Ops Portal: Where magic happens











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Minimize uptime!



Heterogenous systems that range from single computer embedded systems to a small datacenter.

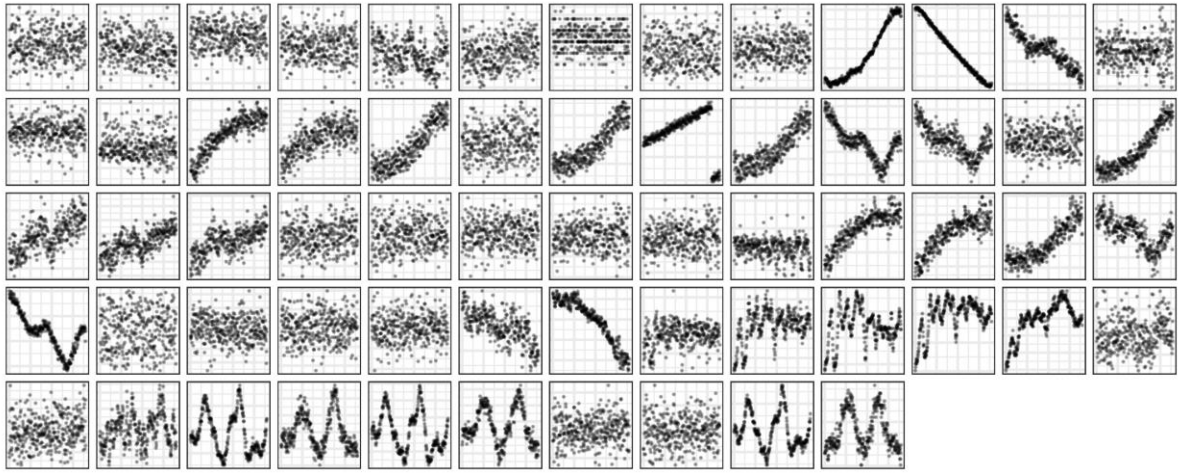
- High degree of interdependency.
- Typically, multiple levels of redundancy.
- Small crew 2-3 technical officers.
- Limited training, limited experience.

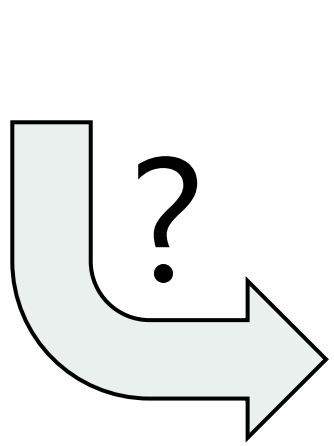
SAAB TECHNOLOGIES SAAB

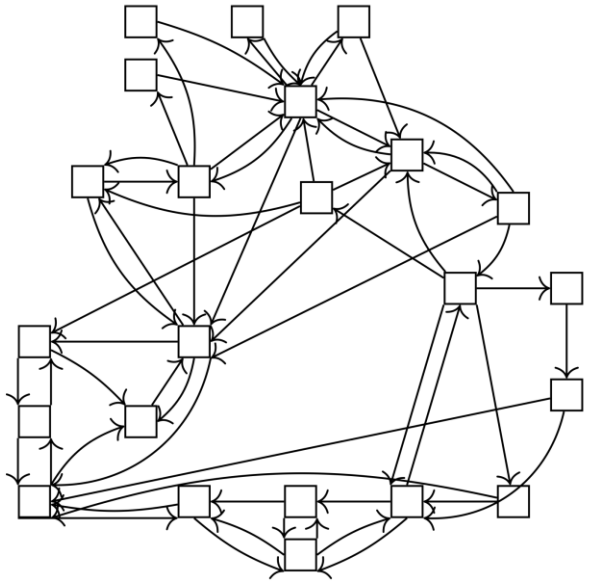
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Causal Discovery in Complex Systems









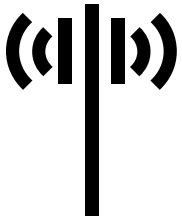
Sören Wengel Mogensen, Karin Rathsman, Per Nilsson. Causal discovery in a complex industrial system: A time series Benchmark. In *Proceedings of Machine Learning Research vol 236:1–17,* 2024

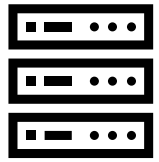
EUROPEAN SPALLATION SOURCE

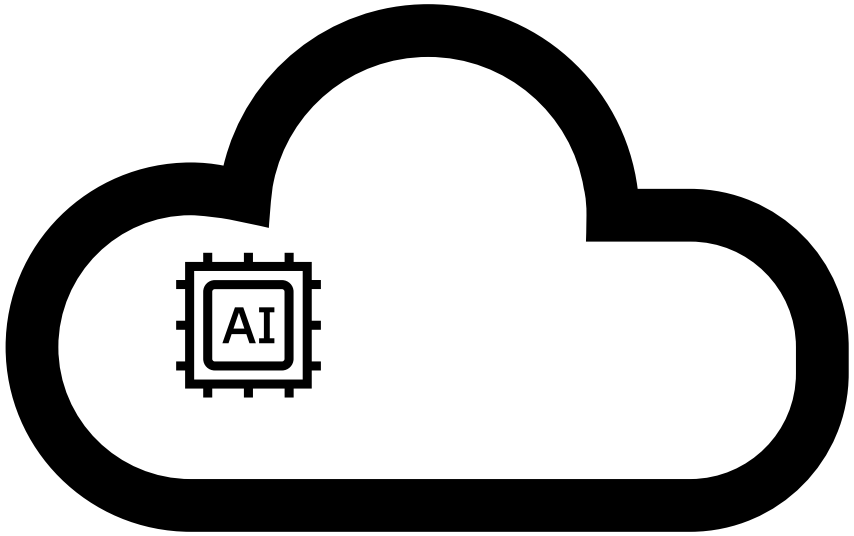
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Create your own dataset and process in the cloud









RobotLab — 5G — Edge — WARA-Ops Portal

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WARA | PUBLIC SAFETY

WARA Public Safety focuses on heterogeneous system-of-systems in joint operation to handle complex scenarios around public safety. This includes unique autonomous vehicles and sensors in true multi-domain; in the air and space, on ground, on water and underwater.



Photo: Peter Karlsson, Svarteld foto & form AB

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WASP Research Arena for Public Safety

"Collaborative autonomous agents together with humans and society"

Multidomain research and innovation in the largest individual research program in Sweden ever.
Started 2015.

A **COMMUNITY** with over 90 organizations

- Researchers, large companies, SME, startups, end-users and investors
- Annual events and courses

An open **SYSTEM** for co-creation and validation in real and virtual environment

- Integration of research lab equipment
- Unique industry platforms
- Autonomous agents in all domain

Available **DATA** and capabilities to build customized data sets

- High res and accuracy 3D models
- Recorded videos, images, positions, decisions









LINKÖPING UNIVERSITY · KTH VETENSKAP OCH KONST · CHALMERS · LUNDS UNIVERSITET · UMEÅ UNIVERSITET · LULEÅ TEKNISKA UNIVERSITET · ÖREBRO UNIVERSITET · SMaRC SWEDISH MARITIME ROBOTICS CENTRE

VÄSTERVIK DRONE SCIENCE PARK · Portal.waraps.org · santa anna IT Research Institute · Mälardalen University

SAAB · COMBITECH · SECTRA · ERICSSON · AXIS COMMUNICATIONS · SJÖRÄDDNINGS SÄLLSKAPET

Telia Company · SoftServe · lead Norrköping Science Park · LINKÖPING SCIENCE PARK · VINNOVA Sveriges innovationsmyndighet · TRAFIKVERKET

Polisen · SMaRC SWEDISH MARITIME ROBOTICS CENTRE · innovair · Avancerad Digitalisering

LFV · SJÖFARTSVERKET · WASP WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

FMV · Myndigheten för civilt försvar

WASP Research Arena for Public Safety

"Collaborative autonomous agents together with humans and society“

Research with WASP

- 30 projects inc 24 Phd students

Innovation

- Vinnova projects
- Startups with LEAD
- Experts

Public Safety and Defense with FMV, MSB, LFV, Sjöfv

- End Users
- Relevant Scenarios
- International collaborations

Next gen Industry (Mining)

- Same problems different domains/perspectives





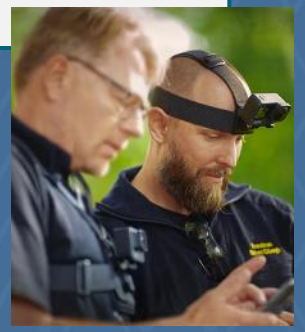




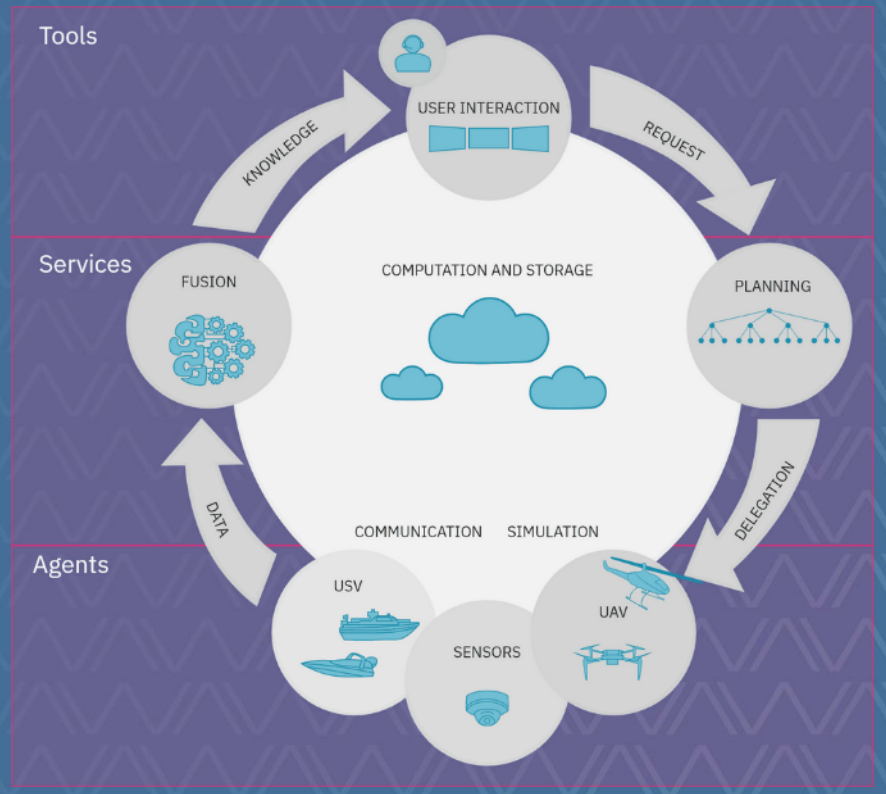
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Mixed research areas placed in a system

Human AI Teaming
Human decisions



Perception and sensors



Cyber security
Critical systems

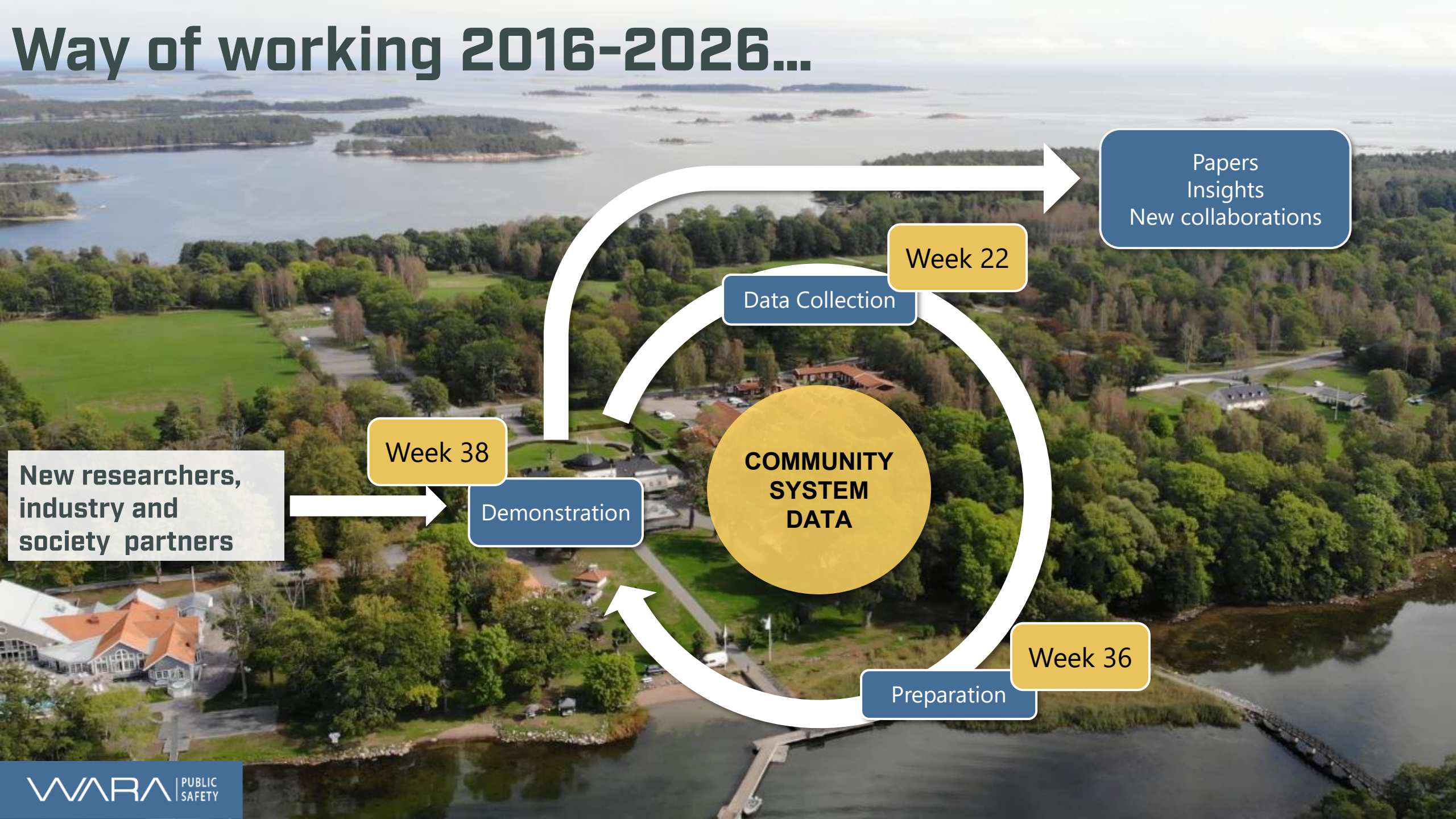
Collaborative robotics, Control, planning,…



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Way of working 2016-2026…

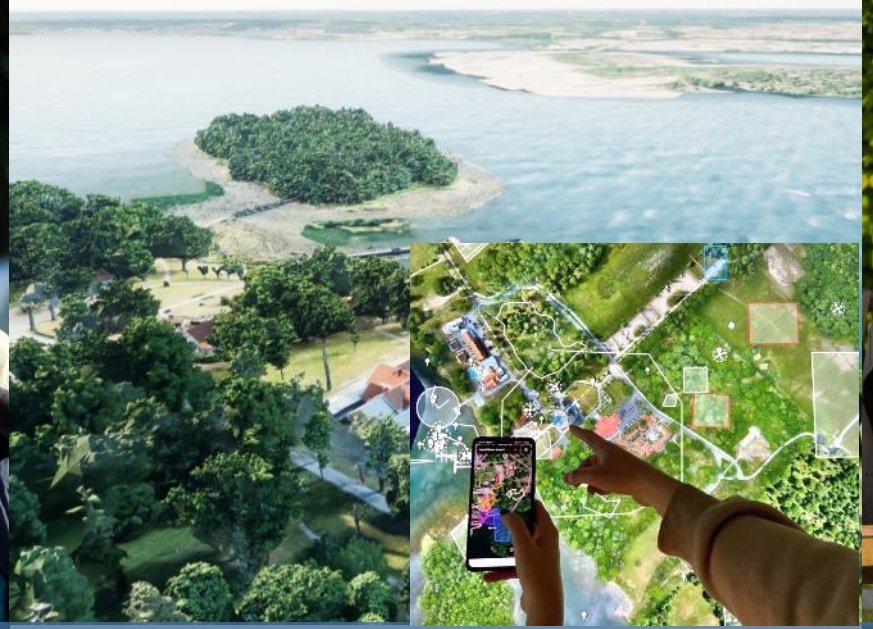


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Field test and Demo EVENTS



Open Integration SYSTEM and Data



METHODS, courses, workshop



COMMUNITY including end users



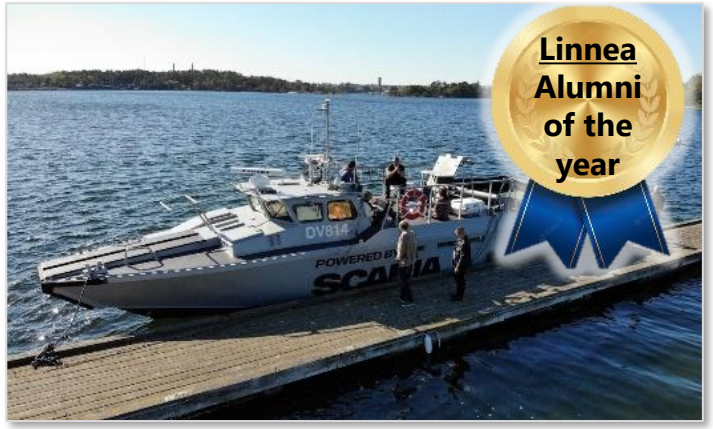




Access to unique technical RESOURCES



Rapid team DEVELOPMENT



Cooperative landing – Model Prediction in multiple vehicles
Linnea Persson, KTH
Dzenan Lapandic, KTH



Digital Cognitive Companions for Marine Vessels: On the Path Towards Autonomous Ships
Mårten Lager, LU



Learning Visual Perception for Autonomous Systems
Gustav Häger, LiU



Self-calibration of redundant sensor systems
Håkan Carlsson, KTH

Examples of successful WARA-PS Phd Students 2016-2025



GPS Free Positioning – Neural networks
Bertil Grelsson, LiU



Autonomous docking and collision avoidance
Birgitta Wingqvist, LU



Robust Learning for Autonomous Robots - Obstacle Avoidance under Uncertainty
Olov Andersson, LiU



Safety-Aware Autonomous Systems: Preparing Robots for Life in the Real World
Mattias Tiger, LiU

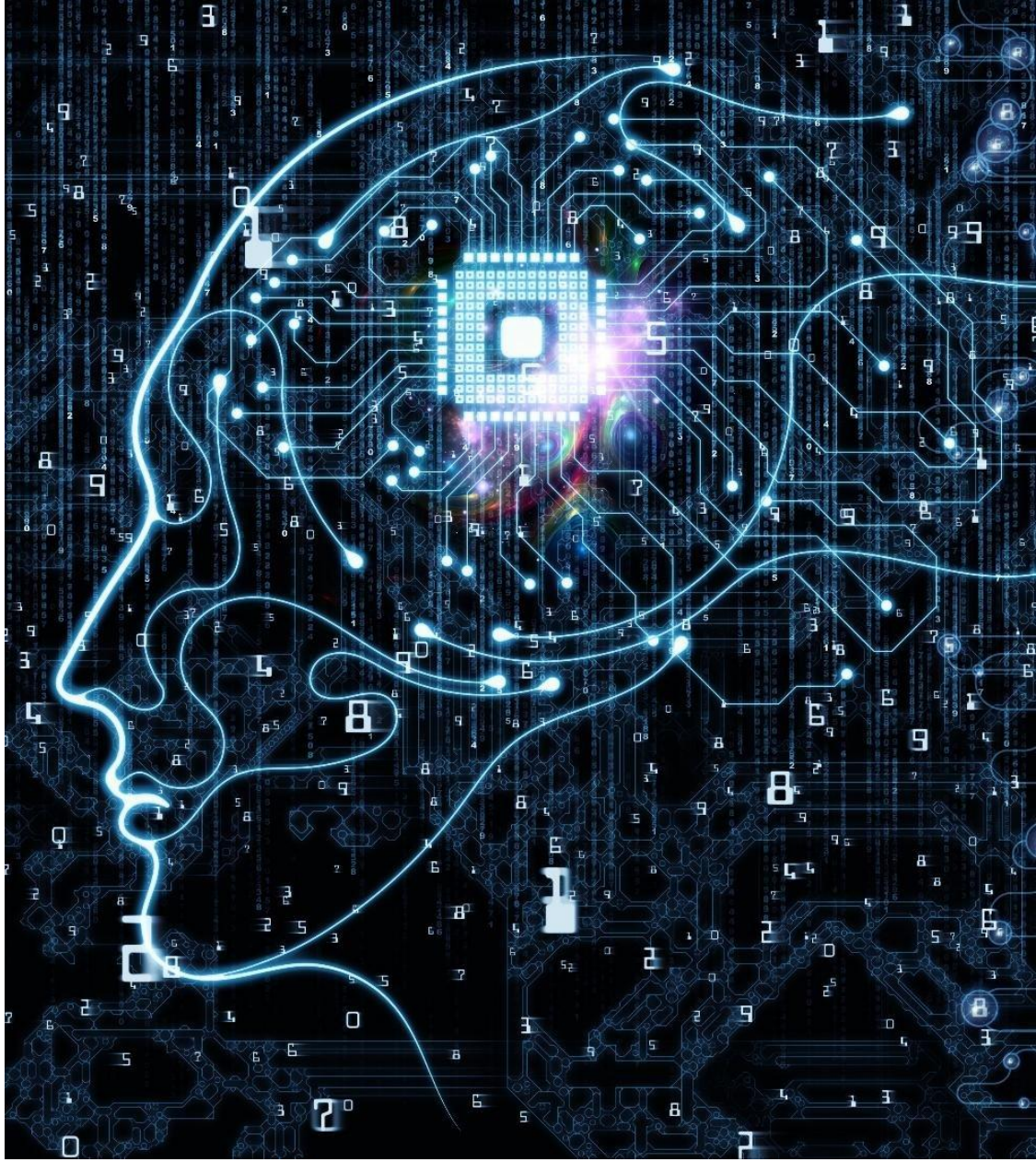
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WARA AI-TRICS

WARA AI Training and Inference Compute at Scale (WARA AI-TRICS) will bring researchers and industry into close collaboration, focusing on real-world data, systems, and challenges where both advanced research and powerful computing capacity are required to drive progress.

Three key areas have been identified as particularly important:

- AI foundation models for industry and society
- AI at Scale, applying AI to massive industrial datasets
- New methods, such as physics-informed AI



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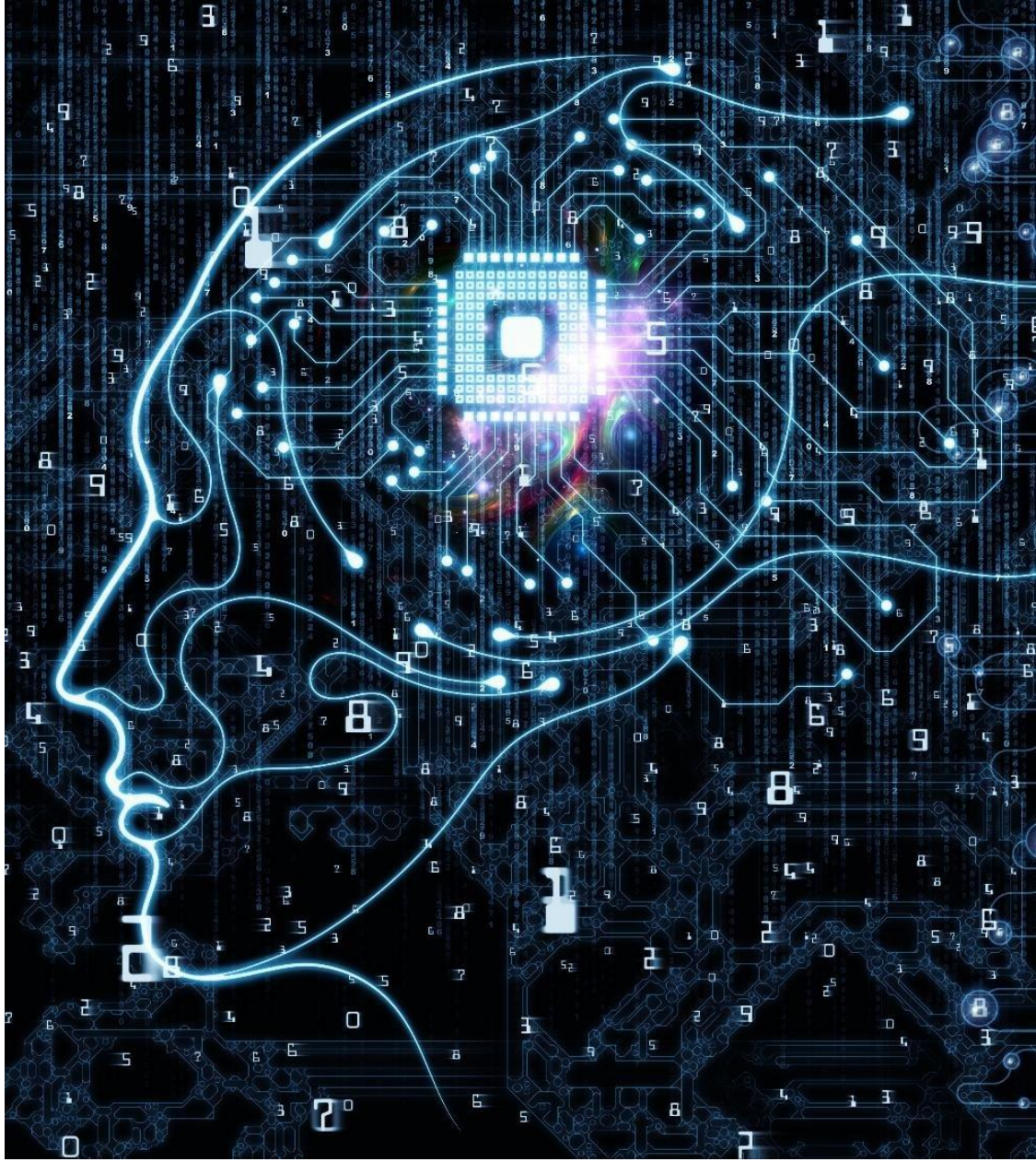
WARA AI-TRICS Industrial participants

ERICSSON

SEB

IPercept technology

NVIDIA



Organisations of journalists, news media, authors, and publishers

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AI foundation models for industry and society

SE.LLMA

Copyright owners share data, we co-create language models and benchmarks to learn and evaluate questions like:

- Do LLMs improve from high-quality text data?
- What benchmarks are relevant in this context?
- Are there novel licensing models to create fairness towards copyright owners?

Time series foundation models

Industrial data consists of a lot of timeseries, text documents and other modalities that are context dependent and rely on domain knowledge.

In this sub-project we will learn if and how industrially relevant foundation models can be trained on industry data!

AI at Scale and Physics informed AI

Reliability

Being able to assess reliability of results from AI systems is crucial for models to be useful in an industrial context. In this subproject we are planning to learn and evaluate whether there are methods to increase reliability of model outputs.

Physics informed AI

This subproject is being detailed together! Stay tuned ☺

Upcoming events

- WASP Digital Career Program – Starts 3 Sep
- WARA PS Demonstration Week 2026 Gränsö 14-18 Sep
- WASP Academia and Industry Days 13-14 OCT – All WARA.s will be present
- **WARA M&L –** Measuring What Matters international workshop on evaluation of generative AI, Skåvsjöholm, November 3-6
- **WARA M&L –** SE.LLMA evaluation workshop and avatar demo, Luleå University, November 23
- **WARA M&L–** Community Days, Stockholm, November 26-27 (tentative)
- **WARA AI-TRICS** – Stay tuned for an upcoming challenge on timeseries!

Contacts & events

- More information and contacts: https://wasp-sweden.org/industrial-cooperation/research-arenas/

- WASP event calendar: https://wasp-sweden.org/events/



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