WARA | ROBOTICS

An Arena for robotics research



WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

Agenda

- Liwei Qi
  - WARA Robotics movie
  - WARA Robotics overview,
  - Arena at ABB Robotics
- Johan Svenningstorp
  - WARA Robotics Arena at Volvo Trucks
  - WARA Robotics Virtual Arena at Algoryx
  - Robotics challenge 2026
  - outlooking 2027, academic point of view of WARA benefits



WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM


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

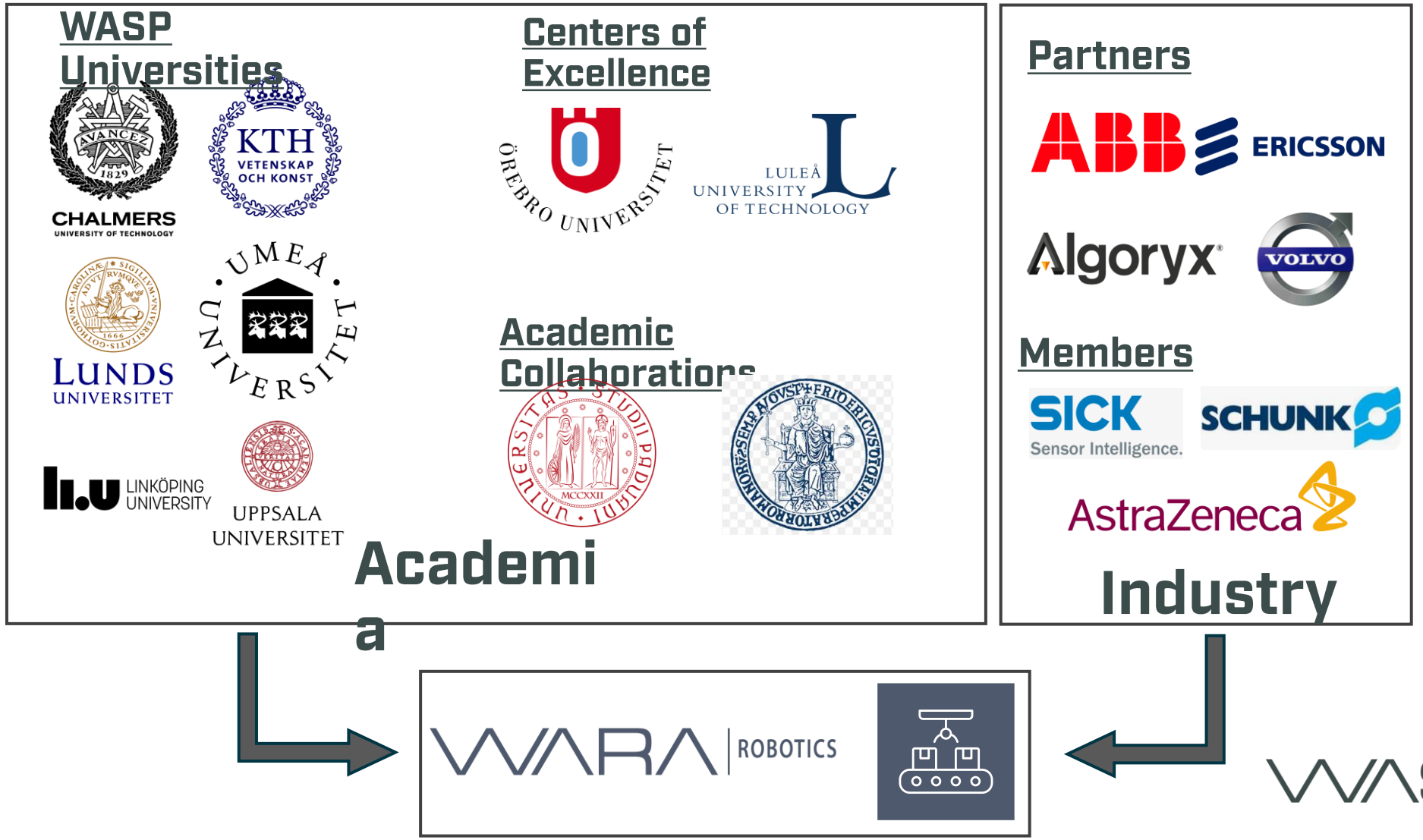
Mission Statement

- **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

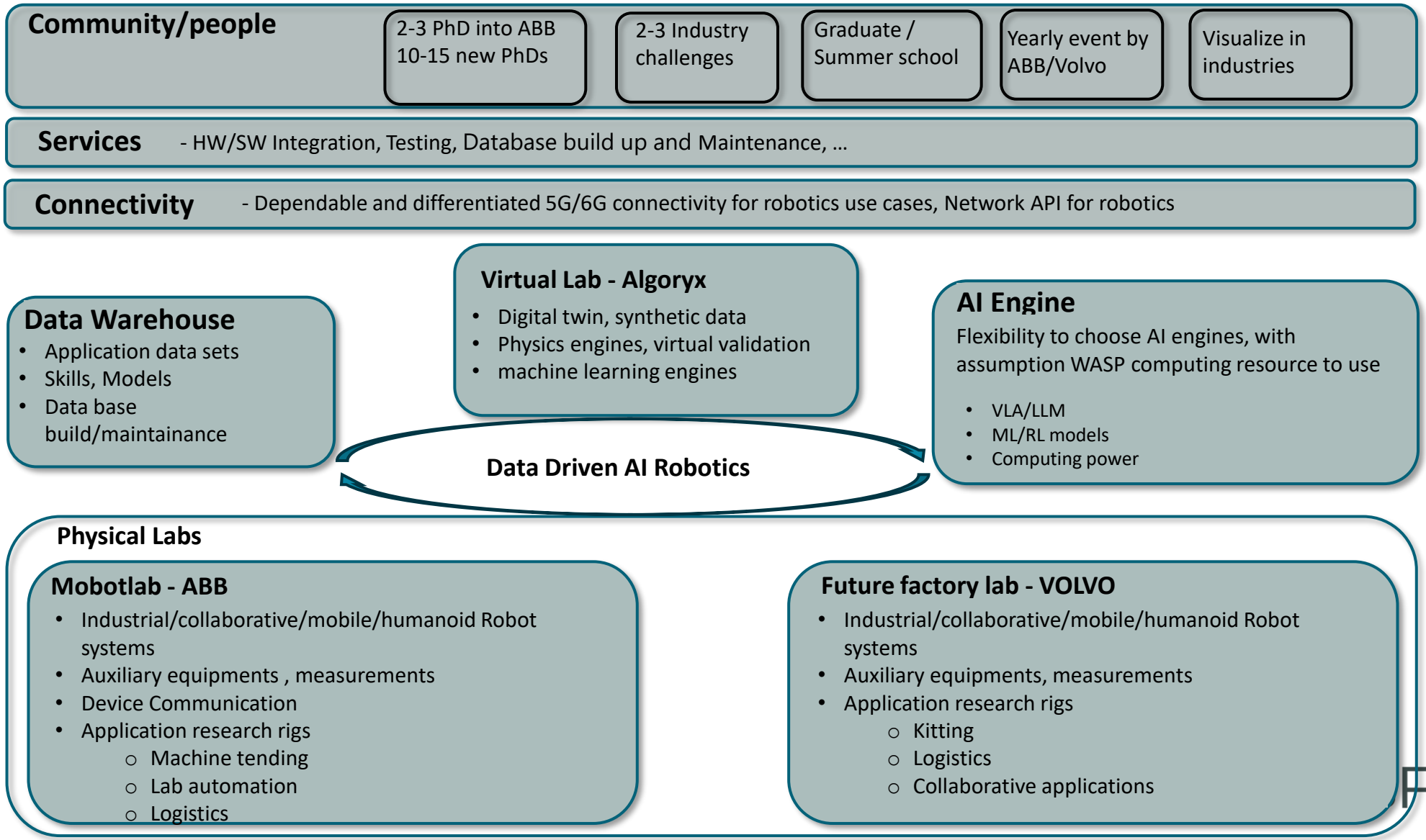


WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

Partners Constellation



WARA Robotics: Plans 2026-28



WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WARA Robotics: Offering at ABB Robotics Site

Robots



Control Interfaces



ROS

Robot Operating System

Robot AI model teaching package



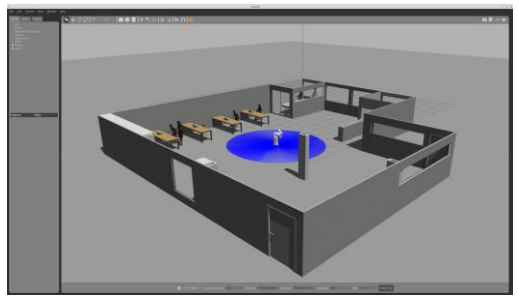
Use Cases: Lab Automation







Digital Lab



GAZEBO



AGX DYNAMICS for UNREAL

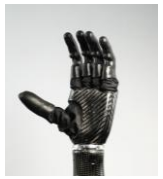
WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WARA Robotics: Data Collection Pipeline

Robot AI model teaching package







Use Cases




External PC

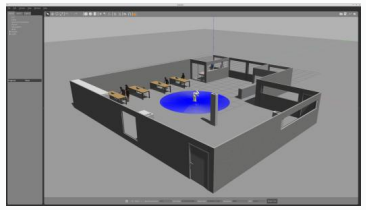


- Interface to robot & grippers (RWS, EGM, ROS)
- Data transformation into common formats

Teaching aids

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

Digital Lab

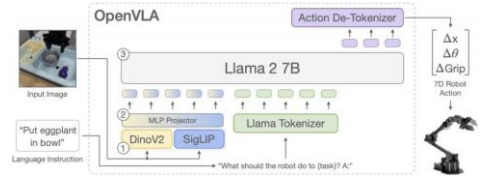



GAZEBO

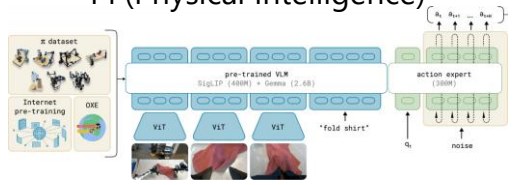
AGX DYNAMICS for UNREAL

VLA models (selection)

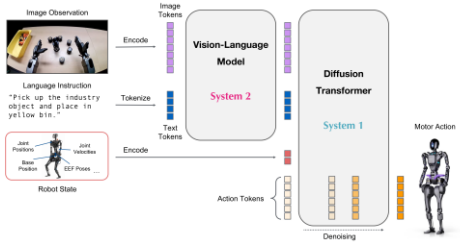
OpenVLA (research, open-source)



Pi (Physical Intelligence)



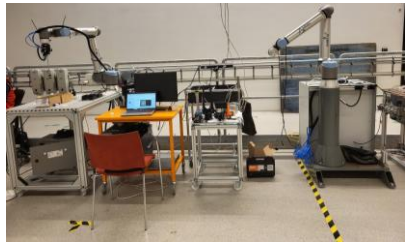
GR00T (NVIDIA)

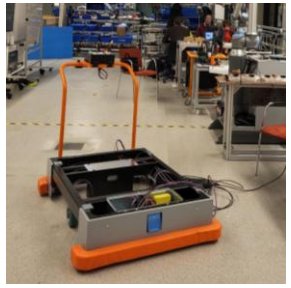


WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

WARA Robotics: Offering at VOLVO Lab & Sites

Robots/grippers







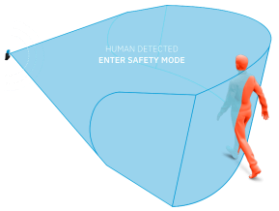




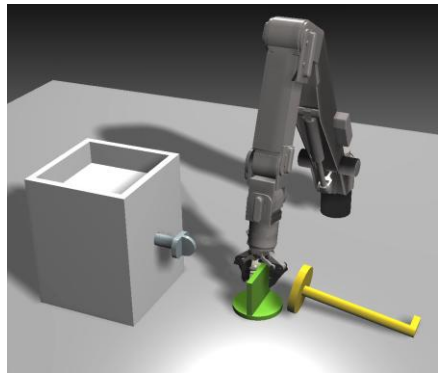
Control, sensors and Data



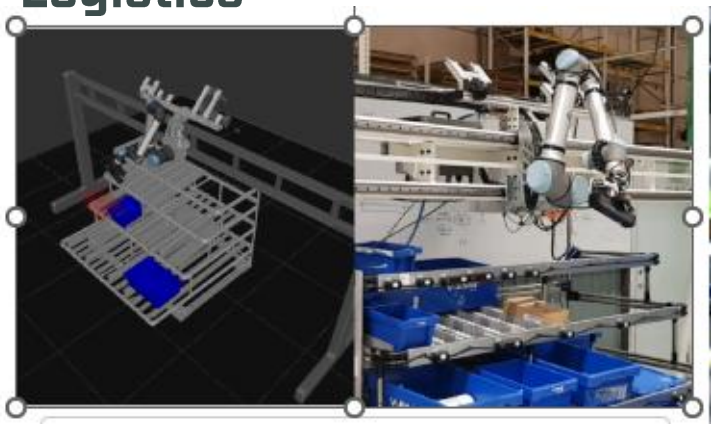




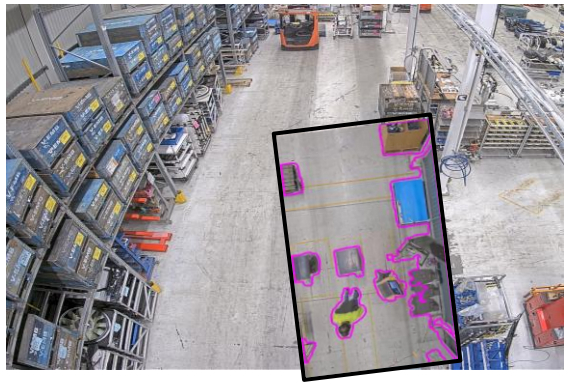
Virtual AI models and models for AI training:



Lab Use Cases: Internal Logistics



Plant deployments: Man maskin interaction, Data including Camera capture





WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM



Vision – Intelligent Automation

80% of Internal Transports should be Autonomus

80% of kitting Autonomus

Teams of robots and humans

Algoryx

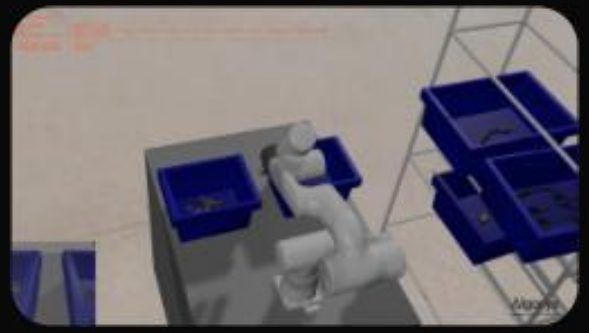
WARA ROBOTICS CHALLENGE 2026

The WARA digital twin



01 The environment

ABB GoFa, Schunk EGU 60 gripper, boxes and Volvo parts, wrist and overhead cameras; AGX Dynamics contacts.



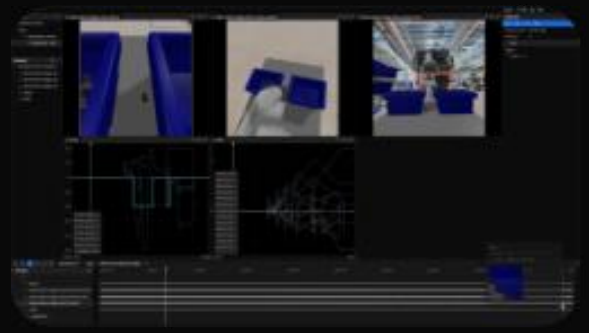
02 Teleoperation

Keyboard or gamepad; each episode saved as a LeRobot dataset, like the real recordings.



03 RL policies

Train in many environments in parallel; trained policies can also collect demonstrations.



04 Data and policies

Inspect and edit the data; train or fine-tune ACT, diffusion or VLA policies and run them in the twin.

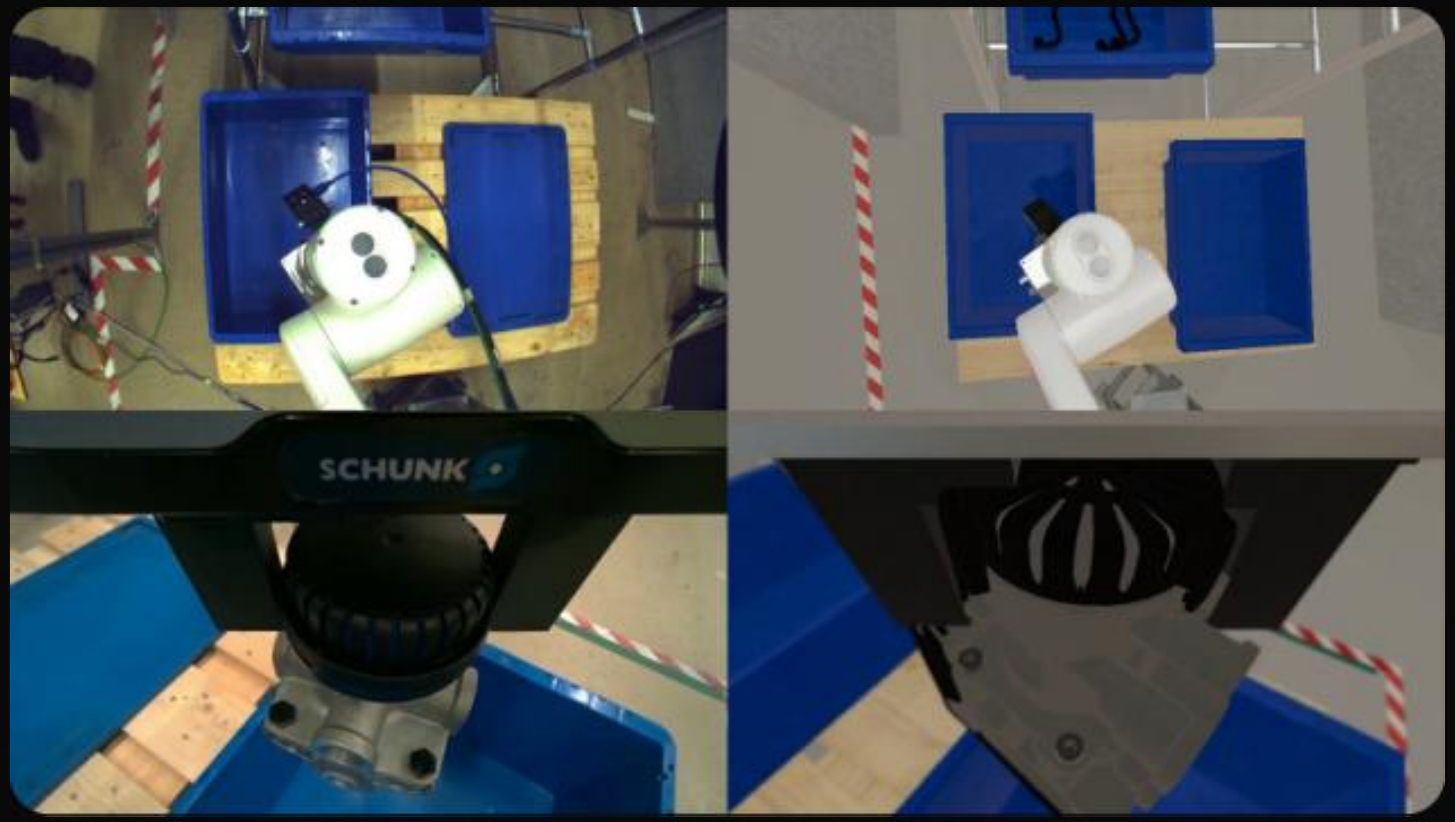
AGXCave A task is a config (scene, sensors, observations, actions, rewards) that serves teleoperation, RL and imitation learning alike: a bridge from AGX Dynamics to the learning tools.

Algoryx

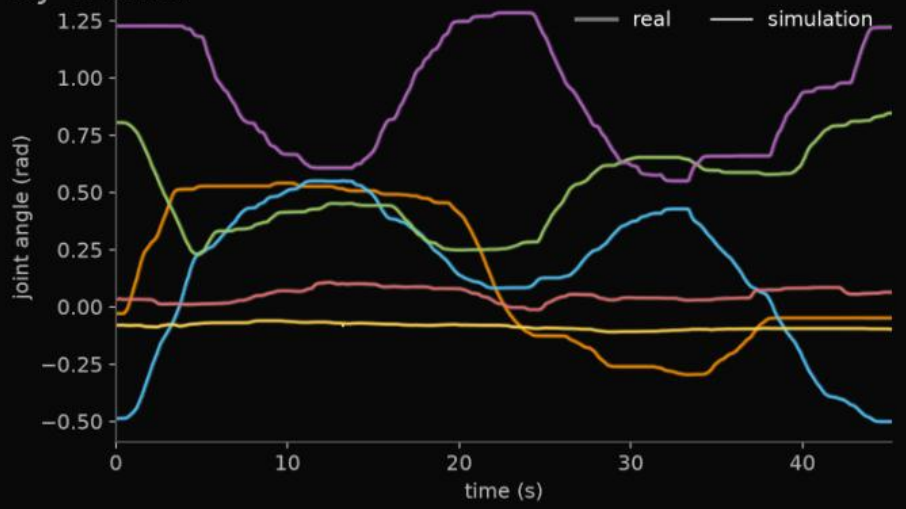
REAL TO SIM

The real recordings, replayed in the twin

REAL SIMULATION



A real WARA recording (first episode, 1.5× speed): its joint angles drive the simulated GoFa, and both cameras are compared frame by frame.



Close to real: with the joint controllers fitted to the recording, joints within 0.09 deg RMS, and the valve picked and placed as in the recording.

Robot Manipulation Challenge 2026

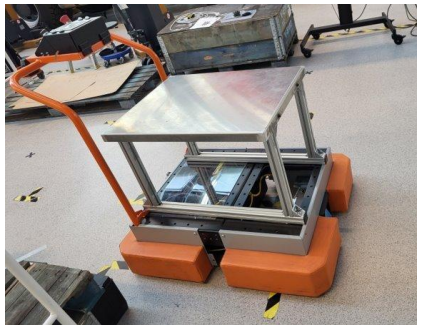
Material handling/Kitting use-case from Volvo

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

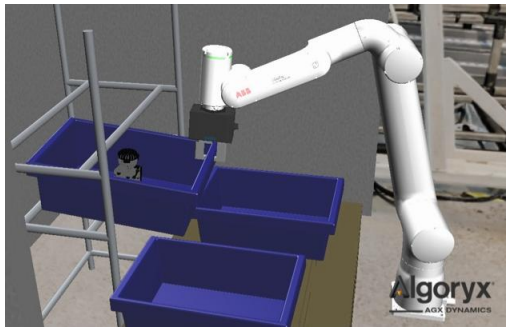
Step 2
- GoFa pulls out a bin from the material facade
  - Contact rich manipulation

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





GPSS robot



Digital twin

→ Collaboration with Volvo Trucks

→ 8 teams registered

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

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM

What's in it for you?

- Access to state-of-the-art hardware and engineering support
- Common datasets for robot manipulation
- Data collection setup: bring your own problem and collect demonstrations
- Industrial use cases: solve real problems people actually care about

WARA | ROBOTICS

Website

LinkedIn

WASP | WALLENBERG AI, AUTONOMOUS SYSTEMS AND SOFTWARE PROGRAM