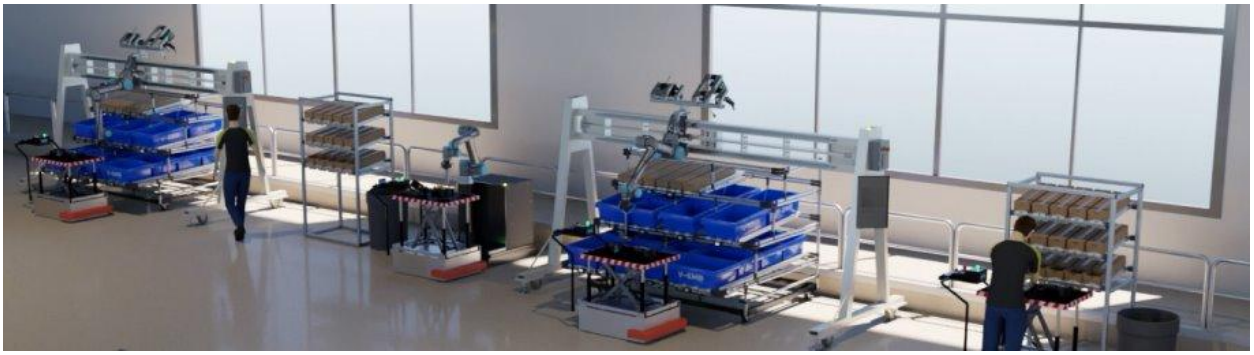

WARA ROBOTICS CHALLENGE 2026

Overview

Field	Details
Dates	2– 3 December 2026
Location	Volvo Future Factory at CampX, Gothenburg
Participants	Master students, PhD students, Postdocs
Team Size	1+

About the Challenge

The WARA Robotics Challenge 2026 is a collaborative research initiative built around a real industrial use case, inspired by assembly and logistics scenarios at Volvo. Participation is open both to individual researchers and to teams. This reflects the structure of the challenge itself, which is organized around complementary subtasks that allow participants to contribute at different levels and with different technical priorities.

The main theme of this edition is Physical AI, with a focus on combining perception, decision-making, and action in a factory environment. WARA Robotics will provide support for a Physical AI-oriented setup, including hardware, software, and a dedicated data collection week. At the same time, every other method is welcome. Teams are free to use their own hardware, sensors, software, and research approach.

The goal is to offer a practical and engaging setting in which meaningful industrial tasks can be explored from different technical perspectives. In this way, the challenge is intended to support hands-on experimentation while creating space for solid and relevant research.

Challenge Setup

The challenge takes place in the Volvo Future Factory. The environment includes material facades (Figure 1), pallets, bins, robotic stations, and pull-out bins (Figure 2). The setup is designed to resemble a realistic factory environment, where robotic systems must operate reliably despite variation in part presentation and surrounding conditions.

The overall setup involves two robotic platforms with complementary roles. An ABB GoFa robot (Figure 4) is mounted on a fixed platform and is responsible for picking parts from the selected station and placing

them onto a mobile GPSS robot. The GPSS robot (Figure 3) is responsible for navigation, moving through the factory environment and positioning itself accurately at the pickup point near the GoFa.
In the overall task, the GPSS robot first navigates to the pickup point near the GoFa. Once in position, the GoFa performs the pick-and-place by transferring parts from the selected station onto the GPSS robot.

Figure 1: Material facade

Figure 2: Pull-out bin

Challenge Tasks

The challenge is structured around two main subtasks: *Navigation* and *Pick and Place*. Participants may address either subtask individually or work on both, depending on their research objectives and technical scope.

Navigation

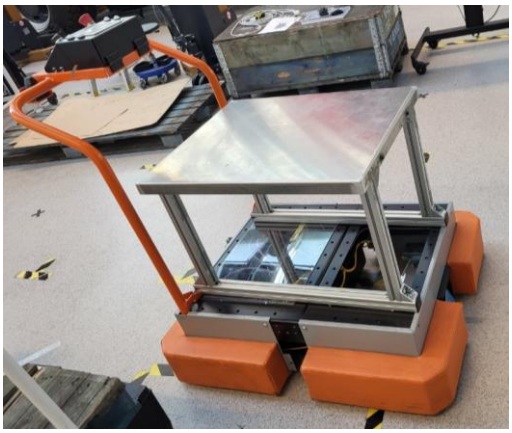

Figure 3: GPSS Robot

The navigation subtask concerns the GPSS robot and its ability to operate reliably in a realistic factory environment. Its role is to move through the workspace and reach the pickup point near the GoFa with the accuracy required for the subsequent manipulation stage.
This subtask includes motion in cluttered industrial surroundings, safe reaction to changes in the environment, and accurate positioning at the pickup point. The quality of the navigation solution is therefore closely tied to the overall performance of the system, since stable and precise positioning of the GPSS robot is a prerequisite for an efficient handover to the GoFa.

Pick and Place

The pick-and-place subtask concerns the GoFa robot and its ability to detect, grasp, and load industrial parts onto the GPSS robot. The subtask is intentionally open in scope, allowing participants to define a direction that is consistent with their methods and research interests while remaining grounded in an industrially relevant problem.

A range of parts will be available, with variation in size, shape, weight, material, and surface properties (Figure 5). Participants may choose which part, or set of parts, they wish to address. The picking task can be carried out from one of the following source stations: a material facade with blue bins, a pallet, or a bin mounted in a pull-out storage (Figure 2). In the latter case, the manipulation sequence may also include the optional step of pulling the bin outward before the picking operation begins.

Figure 4: ABB GoFa

Figure 5: Industrial parts for the pick-and-place task

For each selected part, the task can be considered at different levels of difficulty, defined by the degree of clutter in the picking scene to be handled:

- *Easy*: the target part is presented in isolation within the specific source station.
- *Intermediate*: the target part is presented in a moderately cluttered setting, together with a limited number of additional instances of the same part.
- *Difficult*: the target part must be picked from a highly cluttered scene containing many additional instances of the same part.

Supported Challenge Setup

The partners of WARA Robotics will provide technical support for the setup below.

Component	Description
Fixed robot	GoFa mounted on a fixed platform
End-effector	Schunk grippers
Perception sensors	Sick and RealSense cameras
Mobile robot	GPSS robot
Simulation	Digital twin of the factory environment in Algoryx AGX Dynamics

ABB Robotics will also organize a dedicated data collection week for teams interested in collecting real data from the factory setup. This is especially relevant for teams working with Physical AI, but it can also be valuable for other approaches.
Teams are also welcome to use their own hardware and methodology. This flexibility is fully compatible with the structure of the challenge and the range of possible research directions. Technical support, however, will be limited to the supported setup described above.

Evaluation and Opportunities

Each team's contribution will be assessed by a jury composed of WARA Robotics partners and members, with consideration given to the subtask or scope selected by the team. The evaluation will focus on three main criteria: safety, efficiency, and robustness. Beyond the evaluation itself, the challenge provides an opportunity to investigate relevant industrial problems in a realistic setting, exchange ideas with other participants, and connect technical work to concrete application scenarios. Strong contributions may lead to further visibility within the WARA Robotics network and may also open up opportunities such as internships with partner companies and support for participation in major robotics conferences or fairs.

Timeline

Date	Milestone	Details
30 June 2026	Registration deadline	Teams submit registration and finalize group composition.
1 September 2026	Challenge kickoff	Access to initial resources and challenge material.
September 2026	Data collection week	On-site introduction to the setup and data collection for interested teams.

Date	Milestone	Details
November 2026	Pre-testing phase	Preliminary on-site testing and refinement.
2–3 December 2026	Final demonstrations	On-site demonstrations in simulation and real conditions.

Registration and Contact

Register by **30 June 2026** using the dedicated registration form: LINK.

For questions, contact:
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