

## In this issue

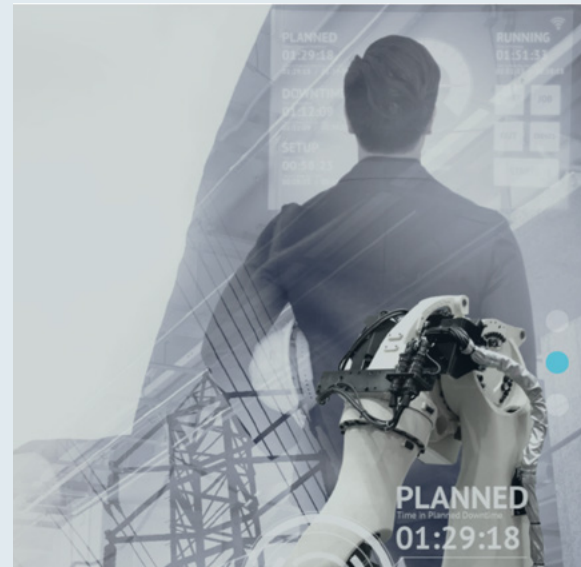
Discover ODIN | Our latest blog posts | Events

## DISCOVER ODIN

### The challenge

While robots have proven their flexibility and efficiency in mass production and are recognized as the future production resource, their adoption in lower volume, the diverse environment is heavily constrained. The main reason for this is the high integration and deployment complexity that overshadows the performance benefits of this technology.

If robots are to become well accepted across the whole spectra of production industries, real evidence is needed that they can operate in an open, modular and scalable way.



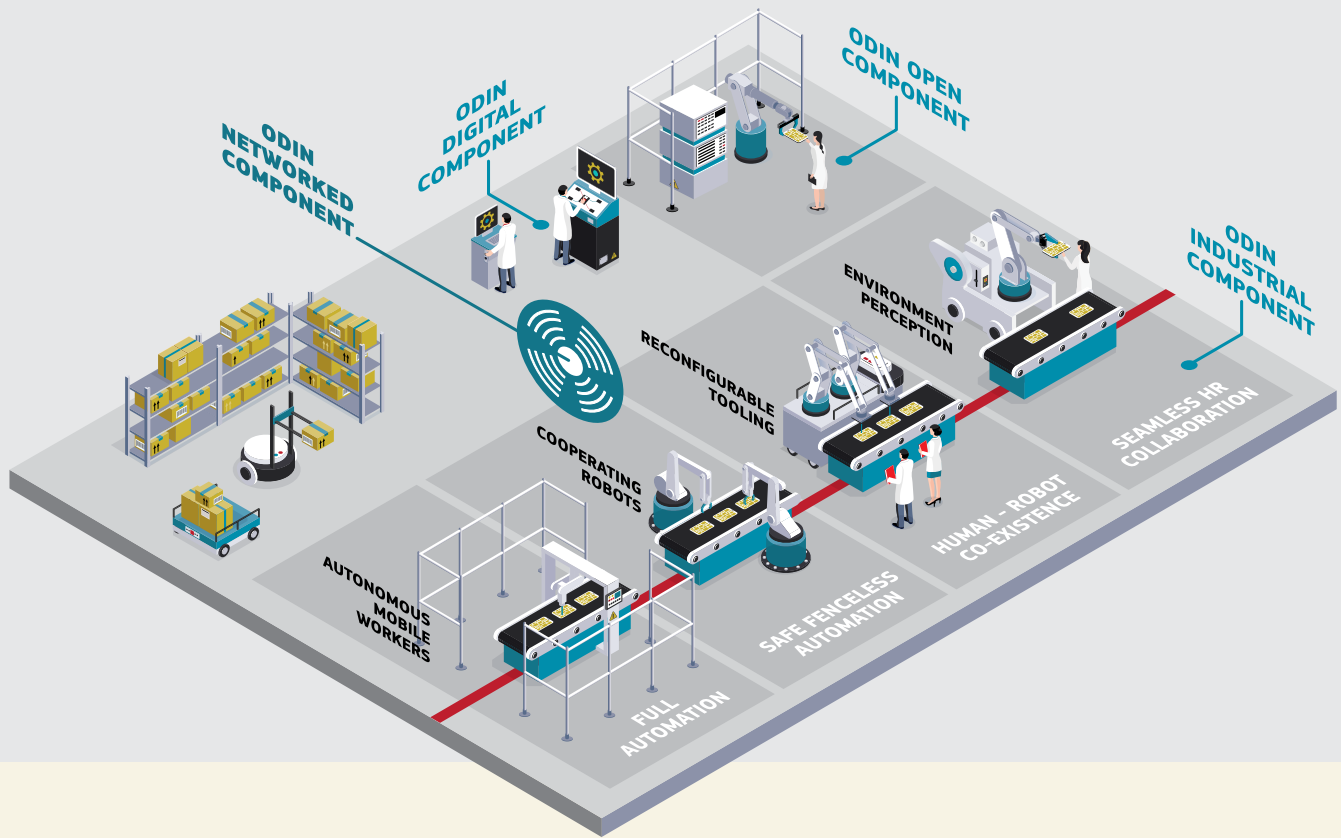
### Project Overview

ODIN will bring technology from the latest ground-breaking research in the fields of:

- collaborating robots and human-robot collaborative workplaces
- autonomous robotics and AI-based task planning
- mobile robots and reconfigurable tooling
- Digital Twins and Virtual Commissioning and
- Service-Oriented Robotics Integration and Communication Architectures.

To strengthen the EU production companies' trust in utilizing advanced robotics, the vision of ODIN is:

*“to demonstrate that novel robot-based production systems are not only technically feasible but also efficient and sustainable for immediate introduction at the shopfloor”.*



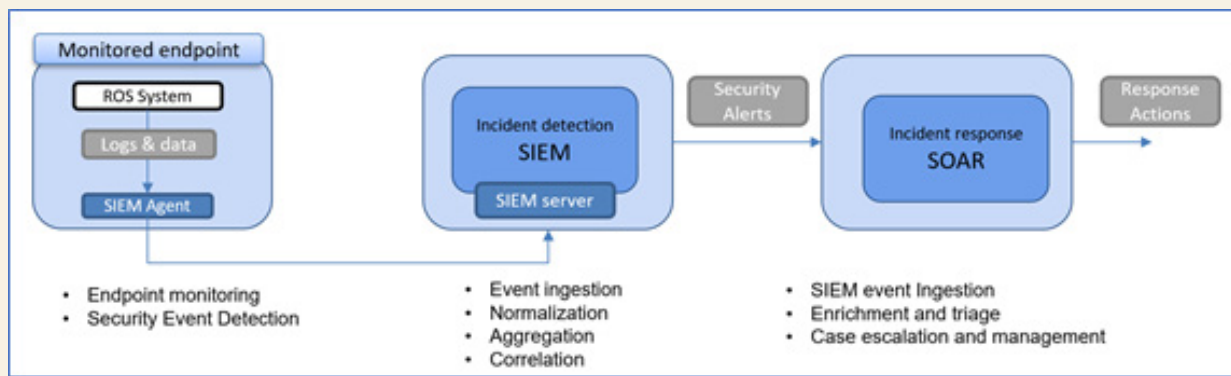
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## THREAT INTELLIGENCE AND INCIDENT RESPONSE IN INDUSTRIAL AND ROBOTICS ENVIRONMENTS

The emergence of Digital Twins (DT) in industry has been a major breakthrough in the improvement of industrial processes. It has also allowed the inclusion of simulations in an environment where trial-and-error method was used up to now, thus minimising the industrial waste generated by these tests and optimising the industrial process by means of different data processing techniques.

The use of meta-operating system frameworks such as Robot Operating System (ROS) provides multiple possibilities to interact with the robot and optimise its operation in real time. Nevertheless, the libraries and the protocols they use (ROSTCP and ROSUDP) have security vulnerabilities (e.g. ROS v1 was not designed with security considerations) that can provoke an external attacker to gain control of the robot. This may lead to consequences at shopfloor level, such as damaging the system, stopping production, or even affecting the safety of an operator.

[Read the full blog post here](#)



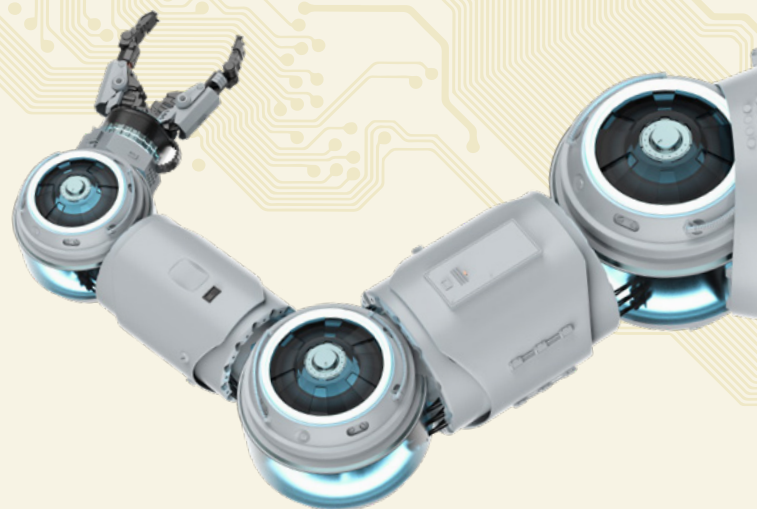
## SAFETY CHALLENGES IN THE INTERACTION BETWEEN PEOPLE AND AUTONOMOUS VEHICLES

Safety in the operation of Automated Guided Vehicles (AGVs) and Autonomous Mobile Robots (AMRs) in the industrial environment is crucial to ensure the protection of people and assets in the space where their tasks are carried out. These systems are rapidly expanding due to the multiple benefits they offer, but at the same time, the increase in their number and the complexity of their tasks generate new risks that must be properly managed.

ISO 3691-4 is an international standard that establishes preventive measures and technical specifications to ensure the safety of autonomous vehicles. This standard is essential for any AGV or AMR implementation project, as it provides a complete guide on how to design the vehicle and the installation, as well as the safety measures that must be implemented.

Artificial intelligence applied to localization systems (SLAM), motion planning (Path-Planning), and fleet management systems are also key tools in the safe operation of autonomous vehicles. These constantly evolving applications allow optimizing processes and ensuring the efficiency of autonomous vehicles, knowing the real-time position of each robot.

[Read the full blog post here](#)



# “DO IT YOURSELF” RELIABLE DGH DEEP LEARNING TOOL FOR INDUSTRIAL QUALITY INSPECTION PROCESSES

DGH, throughout all our 40 years of experience, is deploying its expertise in two complementary ways of business related with manufacturing industry. Firstly, our Engineering Division delivers automatic industrial installations based mainly on robotics, and secondly, the Maintenance Business Unit offers complete outsourcing industrial maintenance services. Both businesses let us have accurate insights of needs from end users of several sectors, and our Innovation and Technology Department merges this valuable information with our capabilities to offer innovative and useful technical proposals that can be implemented on production lines with affordable ROI's.

Under these mandatory premises, ODIN has provided DGH an amazing framework in which we have had the chance to collaborate with partners from all over Europe and share our experience and our point of view with them to handle different challenging issues. Particularly, we have figure out how Deep Learning tools for quality inspection with 2D cameras could be deployed in different sectors, with a standardized and effortless procedure.

[Read the full blog post here](#)

DDH Deep Learning Tool

Home Dataset Review Training

Discover

DGH ingeniería mantenimiento industrial

Load DGH Project

Amortiguador\_Object\_Detection

OBJECT\_DETECTION

Project file: C:\Users\2612\Desktop

Label Classes: 0: Rotor

Labels / Images: 25 labels in 26 of 32 images

Creation / Modification time: 17-06-2022 11:44:15 / 17-06-2022 11:44:15

DGH ingeniería mantenimiento industrial

New Project

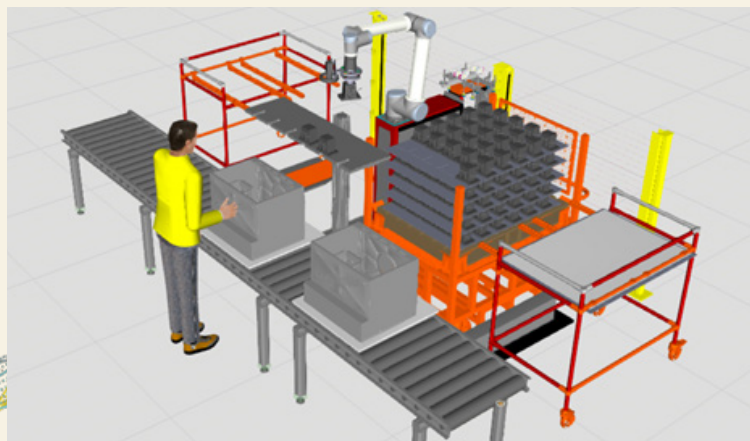
Classification Object Detection Anomaly Detection Segmentation

# FLEXIBLE WORKSTATION IN THE ASSEMBLY LINE OF WHITE GOODS

In the ODIN project, Whirlpool is exploring a disruptive innovation that meets the digital transformation needs of the company and can make the white goods production process even more efficient. Digitalisation, Virtual simulation and virtual commissioning are used to reprogram/ reconfigure a robot for a new product variant in order to integrate new processes, to teach new interaction schemes with humans and to replicate the solution to similar cases with minimum cost/effort.

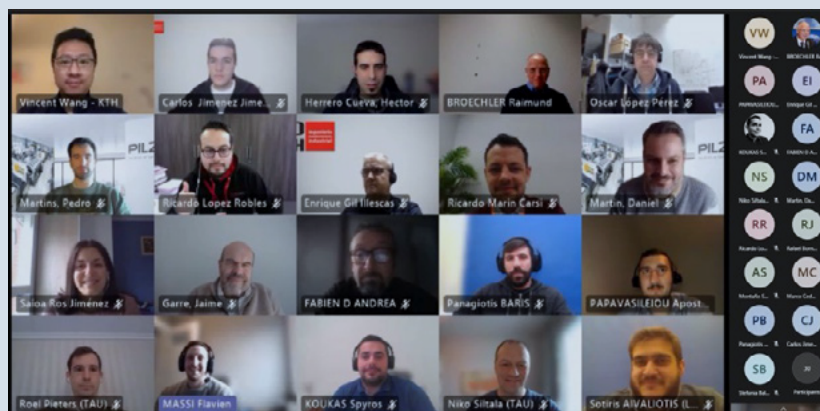
Whirlpool is exploiting the Digital Twin of the physical robotized workstation that manages one component (transformer) in a physical space: the cobot and worker coexist without any physical barrier to let the operator pick and install it inside the microwave oven, which is moving on a continuous flow assembly line. The Digital Twins allows Whirlpool to have the exact virtual representation of the real workplace, a quick and safe testing of various solutions or several constraints and to transfer the selected solution to the real lab environment for a final close-to-real validation.

[Read the full blog post here](#)



## EVENTS

### ODIN 4TH GENERAL ASSEMBLY MEETING



The ODIN project had its 4th General Assembly meeting on the 25-26 of January 2023, closing the first 2 years of project. The partners discussed the technological advances, the technical implementation within the three (3) use cases and the planned activities for the second half of the project.

## ODIN AUTOMOTIVE PILOT WORKSHOP AT STELLANTIS

On the 2nd of February 2023, ODIN partners participated to the “ODIN Automotive Pilot Workshop” organised by STELLANTIS at their Mattern Lab in Sochaux (France). The event consisted in an on-site tour of STELLANTIS plant including the selected assembly scenario of investigated in ODIN. During this workshop, several interactive discussions took place regarding the optimization of ODIN Open and Digital components during specific industrial operations.



## THE EUROPEAN ROBOTICS FORUM 2023

Since the first day of ODIN project, we have always been actively involved in the European Robotics Forum series and over the 4 years of project’s lifetime we set some targets to not only participate but to also organise clustering activities as part of the ERF.

In March 2023, the ODIN project was well represented during the conference held in Denmark with thanks to the participation of our Coordinator the Laboratory for Manufacturing Systems and Automation (LMS) and our partners COMAU, ROBOCEPTION GmbH and PILZ. During ERF 2023, the ODIN representatives participated in the “10th Workshop on Hybrid Production Systems” while LMS presented ODIN project’s latest updates during the session on “AI for Human Robot Collaboration”.



## WHIRLPOOL AT THE 6TH ANNUAL SMART MANUFACTURING EXCELLENCE SUMMIT

In March 2023, the ODIN project was presented to the audience of the 6th Annual Smart Manufacturing Excellence Summit held in Munich (Germany). Indeed, Marco Cederle, Process Technology Engineer at Whirlpool, participated to this event and took this opportunity to share the experience of Whirlpool in the ODIN project in front of more than 100 participants and industry leaders. Several topics were addressed in his speech entitled “Digital Twin for Reconfiguration of Collaborative Robotic Cell: ODIN project at Whirlpool”, such as Digital Twin, Virtual Commissioning and Augmented Reality technologies.



# ODIN AT THE MANUFACTURING PERFORMANCE DAYS 2023

In June 2023, our partner Tampere University participated to the “Manufacturing Performance Days 2023” in Finland, a summit gathering technology decision makers to focus on the theme of “Sustainable and Resilient Growth”. In addition of being co-chair of the summit and active in the panel discussion, Tampere University also presented the ODIN project’s objectives and results in a dedicated booth.



## AUTOMOTIVE SMART FACTORY PUBLIC WORKSHOP

On the 25th of May 2023, ODIN partner AIC organised the first ODIN industrial workshop at their Automotive Intelligence Center located in Bilbao (Spain). This event is the first one of a series that will focus on the ODIN automotive demonstrator.

AIC invited all the ODIN partners to participate as well as local industrial actors who show interest in our project and technologies. This event consisted in the following sessions:

- Project Overview presentation focusing on the ODIN components and the large-scale pilot lines.
- Presentation of the automotive pilot line with the participation of relevant ODIN partners, such as STELLANTIS, LMS, TECNALIA and DGH.
- Visit of the automotive smart factory demonstrator at AIC.
- Living discussions between the ODIN partners and the industrial participants.

ODIN consortium was thrilled to finally showcase its demonstrator to the public, in its willingness to disseminate its results to the greatest number of industrial actors.





## TAU AND LMS INTEGRATION WORKSHOP AT LMS PREMISES

From 30th May to 1st June 2023, the first integration workshop for TAU project-based interface module took place at LMS premises. TAU supported by LMS was able to install the required software and hardware components in the LMS pre-industrial setup of the White Goods pilot case. Interactive tables and projectors' calibration successfully completed targeting on the projection of working area inside the layout but also operator's interaction with OpenFlow.



# ODIN 5TH GENERAL ASSEMBLY MEETING

From 20th to 21st of June 2023, ODIN partners participated in the 5th General Assembly meeting of the project which took place at the Laboratory for Manufacturing Systems and Automation in Patras (Greece). This meeting was the occasion for the participants to discuss the overall status of the project, its latest achievements, and the forthcoming activities. Fruitful discussions took place between the WP presentations as ODIN is now having significant results and is planning to achieve even more by the end of the project.



That was the first physical General Assembly meeting of the project and the consortium was pleased to finally meet face-to-face after the project started during the Covid-19 era. COMAU arrived in Patras one week before the meeting to assist on the integration of COMAU mobile robot.



# SAFETY INTEGRATION WORKSHOP AT LMS PREMISES

Following the GA meeting, the joint activities continued with a 2-day safety workshop together with PILZ, in order to perform the required impact measurements under the White Goods demonstrator and validate the solution in compliance with the ODIN safety concept. Further discussions between the partners addressed open technical issues regarding the Automotive pilot safety concept such as the reconfigurable robot tooling, the mobile robot and the safety sensors.



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## Open-Digital-Industrial and Networking pilot lines using modular components for scalable production



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