WELCOME TO THE 7th ODIN NEWSLETTER!

July 2024

In this issue

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.

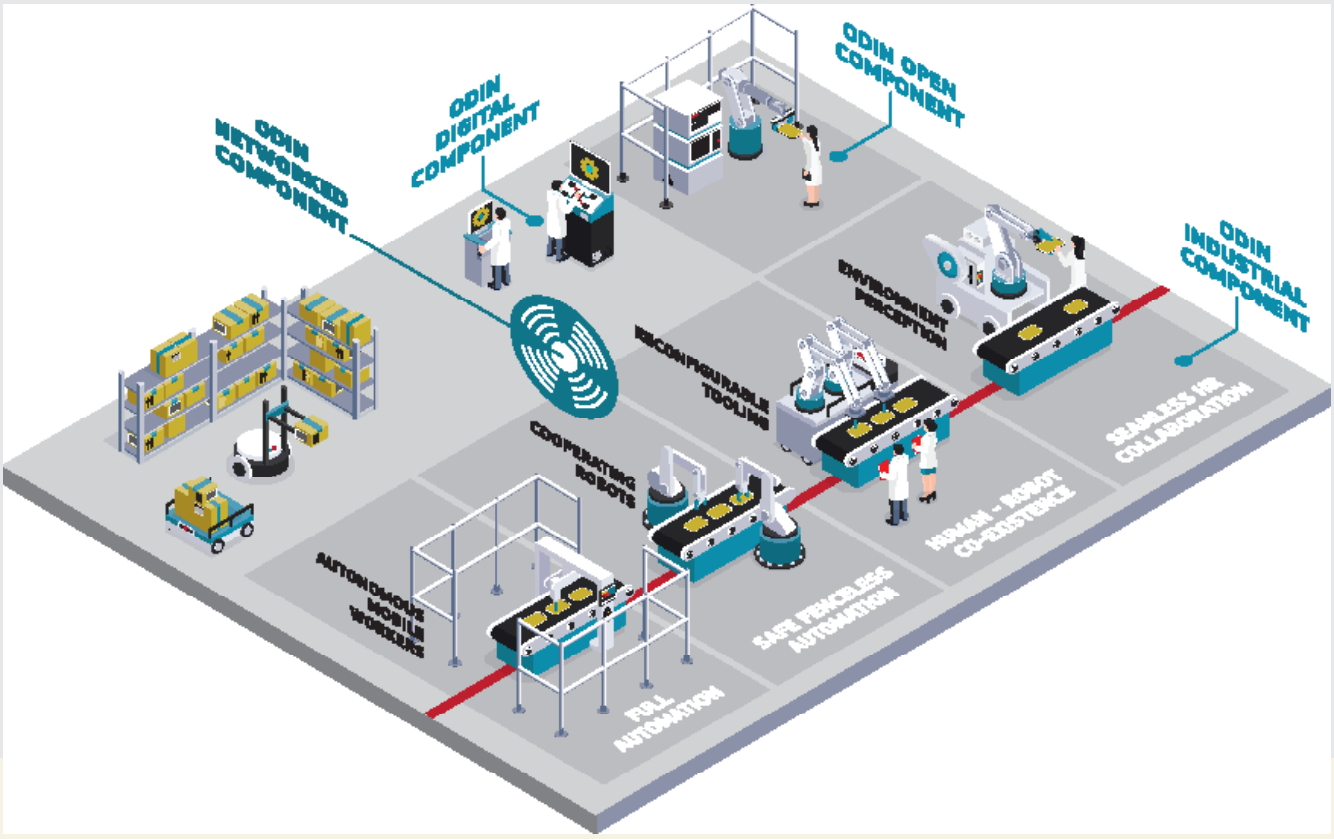
Project Overview

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".



READ OUR LATEST NEWS

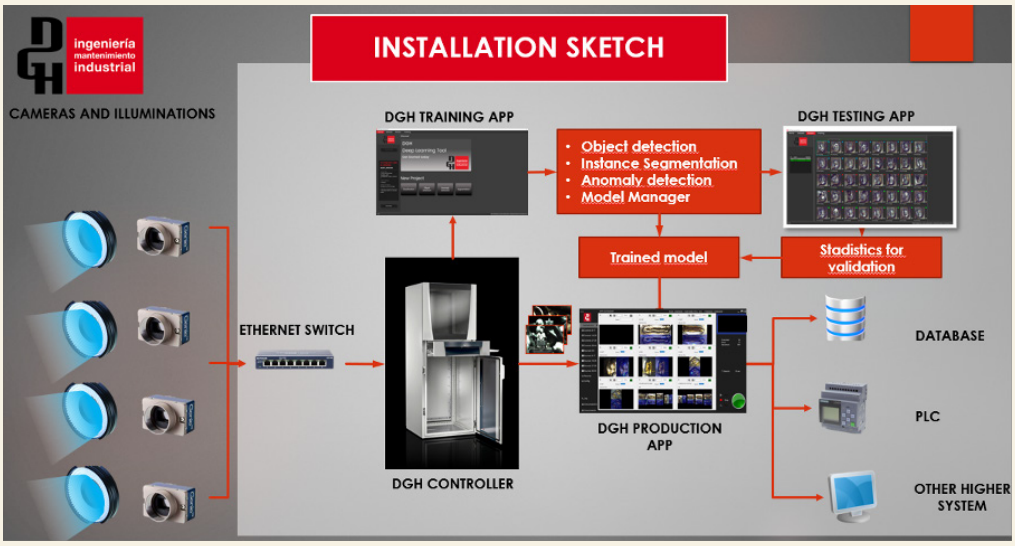
INDUSTRIALIZATION SUCCESSFUL USE CASE FOR VISUAL INSPECTION OF MIG/MAG WELDING PROCESSES

The deployment in a reliable and profitable way of different artificial vision technologies that showed up on the market at beginning of 2000 turned out to be one of the main DGH's priorities to deliver more flexible automatization manufacturing process to its customers. Overall, the use of all different artificial vision technologies could be split into two main topics:

• The combination of robotics and 2D or 3D artificial vision let improve the performance of robotic operations by adapting movements and trajectories under real and changing conditions of production processes. Vision system will process obtained images from the environment to update robots' trajectories to meet correctly with assigned tasks. This expertise allows DGH the design of concepts for automated processes under few mechanical complexities and restrictions.

• Thanks to the analysis of images obtained on manufactured products by 2D or 3D cameras additionally with appropriate software tools, we arrange a proper deployment of quality inspection checkpoints throughout complete manufacturing process of different industrial sectors. In this last topic, introduction of AI has been a breakthrough from traditional strategies based on comparing images under finite number of measurement or appearance patterns to the possibility of teaching the vision system to make decisions by itself with learning rules that do not need to cover all infinite real situations that can occur in a normal production process (Deep Learning technology).

Read the full blog post here



EXPLORING ODIN SOFTWARE ARCHITECTURE FOR FLEXIBLE HUMAN-ROBOT COLLABORATION IN MANUFACTURING

During recent years, the research community has devoted significant efforts to enhancing robot capabilities. These advancements in robot cognition and perception have started a shift in the production paradigm from rigid automation systems to hybrid and collaborative working environments. Collaborative robotics and flexible manufacturing solutions offer competitive advantages for manufacturers. However, implementing a flexible Human-Robot Collaboration (HRC) system is challenging, especially in lower volume, diverse manufacturing environments. In particular, the adoption of robots in such environments is constrained by:

- The high integration and deployment complexity of end-to-end integrated robotic applications.
- The limited flexibility of existing solutions in handling unexpected events dynamically.

Read the full blog post here

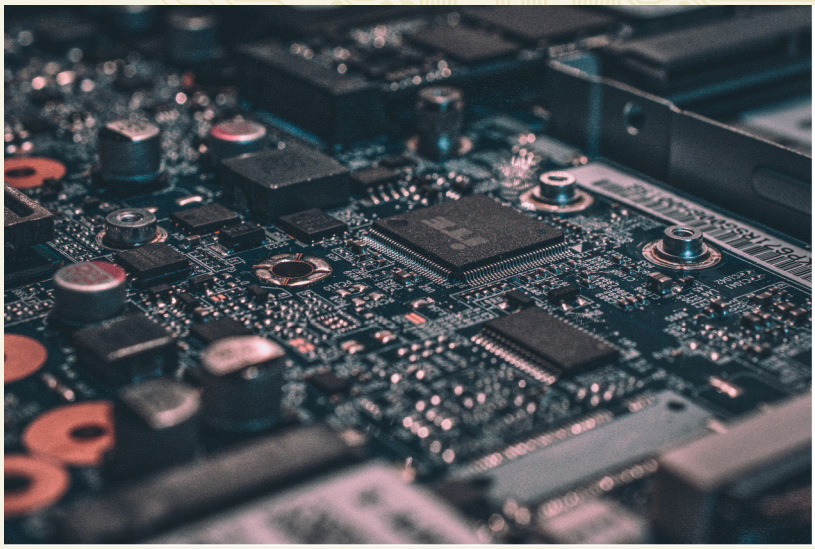


Image by Spyros Koukas based on Photos by Alexandre Debiève on Unsplash

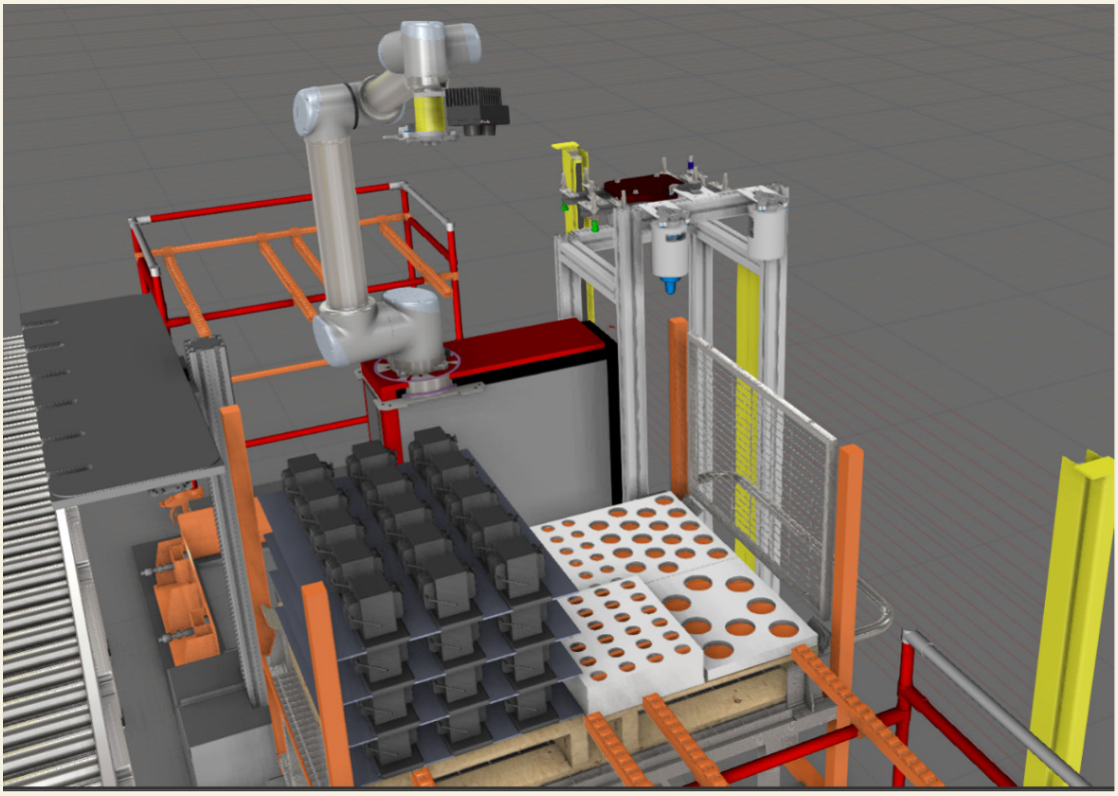
SIMULATION HELPS TO EVALUATE THE CHALLENGES OF ROBOTIC CELL FOR PRODUCING MIX PRODUCTS

In the era of Industry 4.0, the manufacturing industry is increasingly shifting towards high mix/low volume production. Production facilities, originally designed for serial manufacturing, need to adapt to these changes. This includes the robotic cells installed in the manufacturing line, which play a crucial role in the production process.

Handling mixed products has always been a challenge in the manufacturing industry. This is especially true when the information about mixed product production arrives later than the installation of the robotic cell itself. This often leads to a situation where the cell was not designed for the product mix, creating inefficiencies and bottlenecks in the production process.

In the ODIN project, it was observed that digital simulation tools, like Visual Components, can play a crucial role in such scenarios. These tools can help evaluate the capabilities required in the robotic cell to handle mixed product production. This facilitates the identification of challenges in the existing robotic cell. The simulation tool can be utilised for necessary configuration changes in the robotic cell as soon as the information on the design of the product variant is received. This means that all the background work is done for new product variants when the actual robotic cell is still in use for the current product variant in production.

Read the full news article here



ORGANISATION OF THE 2ND ODIN INDUSTRIAL WORKSHOP

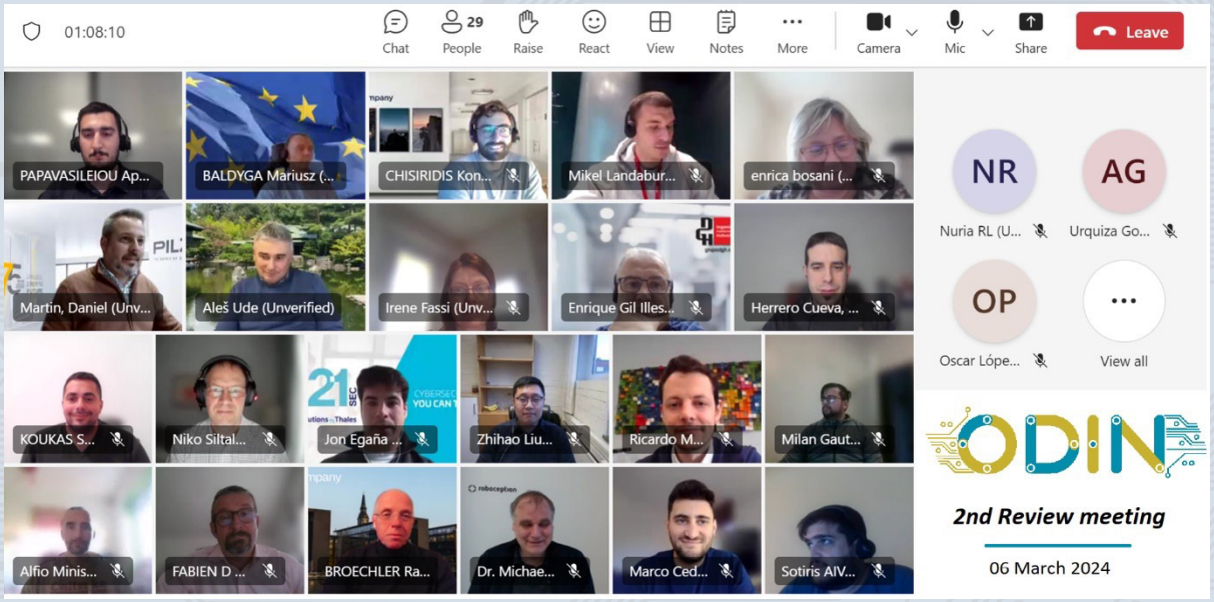
On Thursday 9th of May 2024, the partner AIC organised the 2nd Automotive Smart Factory Workshop at their Automotive Intelligence Center premises in Bilbao (Spain). For this second iteration, we invited the ODIN partners and local industrial actors interested to learn more about our project and technologies while opening the event to European stakeholders via online participation. The event consisted in the following sessions:

- Project Overview presentation: focusing on the ODIN components and the large-scale pilot lines.
- Presentation of the Aeronautics Pilot Line by the partners TECNALIA and AEROTECNIC.
- Presentation of the White Goods Pilot Line by the partners LMS and BEKO Europe.
- Presentation of the Automotive Pilot Line by the partners LMS, STELLANTIS, AIC, TECNALIA and DGH.
- Presentation of the Automotive Smart Factory: demonstration of the inspection process of the engine assembly of gearbox with 2D and 3D camera, as well as the artificial inspection technology carried out.

Read the full news article here

THE 2ND PROJECT REVIEW MEETING

On Wednesday 6th of March 2024, the ODIN project partners gather to present the advancements of the project to the European Commission's Project Officer and the appointed reviewers as part of our 2nd official review meeting. The meeting marked the end of the three-year milestone, and the partners received a very good feedback and appreciation from the external reviewers. After receiving the general project review consolidated report from the European Commission, we are happy to share with you that ODIN has fully achieved its objectives and milestones for the period. We are now fully dedicated to the final year of project implementation and the ODIN consortium is determined to exceed the EC's expectations and will focus on the deployment of the demonstrators and the dissemination of our project results.



THE ODIN PARTICIPATION IN ERF 2024

The European Robotics Forum (ERF) is one of the most impactful annual events in robotics and artificial intelligence in Europe. This year it was held from 13th to 15th of March 2024 in Rimini, Italy. The event attracted more than 1200 participants from 42 different countries with over 100 workshops and more than 70 exhibitors gather around the official thematic of ERF 2024: "ROBOTICS UNITES: People, Countries, Disciplines".

ERF 2024 official opening (image euRobotics)

During this intensive three-day event, the ODIN partners participated in the organization of several relevant workshops including joint workshops with our extended network such as TRINITY Innovation Network and the ACROBA project. In this news article we are describing our different contributions to the ERF 2024 workshops and other promotional activities performed by the ODIN partners.

Workshop "TRINITY Innovation Network - Steps Forward"

The ODIN coordinator LMS participated to the workshop "TRINITY Innovation Network – Steps Forward", organized by the partner Tamper University who is also leading the TRINITY Innovation Network. The workshop brought together different key RDI projects within Europe to discuss Innovation networks and the role companies, academics and other stakeholders can play. Other EU-funded projects also provided their viewpoints and plans regarding the sustainability of innovation networks, including JARVIS, EARASHI, DIGITOP, and DAoL.
The workshop is part of a larger collaboration initiative between euRobotics and Innovation Networks, with a shared interest to support each other's activities and to develop and promote research, innovation and deployment at the intersection of the 4 strategic areas (Inspection and Maintenance, Healthcare, Agile Manufacturing and Agrifood) and Robotics.

Mr. Apostolis Papavasileiou presenting ODIN project at TRINITY Innovation Network workshop.

AI enabled HRC – 11th Hybrid Production Systems workshop

The 11th Hybrid Production Systems workshop was organized by the ODIN Coordinator LMS and aimed at exploring the latest technologies enabling AI-driven Human-Robot Collaboration (HRC). Mr. Apostolis Papavasileiou contributed to the topic by presenting the latest advancements in robotics for agile production and discussing the adoption of innovative robotics technologies in manufacturing.

Mr. Apostolis Papavasileiou presenting the ODIN concept for pilot lines using modular components

ERF 2024 Shaping Tomorrow's Factory: HRC and Agile production

The workshop "Shaping Tomorrow's Factory: HRC and Agile production" was organized by the EU-funded project ACROBA and we had the chance to be invited to present the technical demonstrations from ODIN project such as the AR interface to enhance HRC. The mobile drilling demonstrator attracted high attention from the audience and triggered good discussion in the following panel. Presentation concluded on how reconfigurable systems will have a significant impact on agile manufacturing. In this development, Artificial Intelligence will play a major role in tasks like automatic labelling in vision applications and large language models in robot interaction.

Panel discussion triggered active discussion about future of agile manufacturing

Exhibition and Networking

ODIN partners were also actively disseminating the project results and networking with various stakeholders during the session breaks at the exhibition area. Several new contacts were made, such as the agreement to plan common events with Robocoast EDIH to promote the results to Finnish industry.

Jyrki Latokartano (Tampere Uni) and Apostolis Papavasileiou (LMS) discussing synergies with Juha-Pekka Alanen from ROBOCOAST EDIH

Visual Components promoting ODIN project on their exhibition booth

PRESENTATION OF THE ODIN DEMONSTRATOR AT SIAS 2024

The Safety of Industrial Automated Systems (SIAS) is a conference series taking a close look at R&D activities and best practices in the industry from a safety viewpoint. SIAS2024 has been organized by the **Finnish Society of Automation** in Tampere (Finland) on the 12-13 of June 2024. Our partner Tampere University contributed to the organization of the conference and participated to numerous panel discussions on topics relevant to our ODIN project such as:

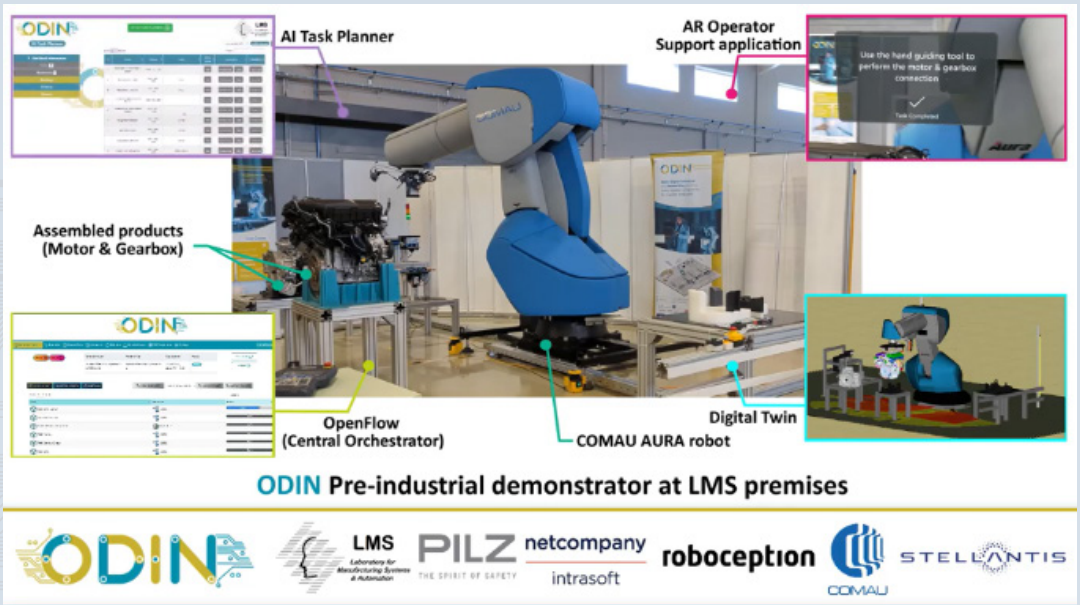
- Safety of machinery concepts and principles
- Collaboration with autonomous machines
- Socio-technical system approach to automation safety
- Safety of autonomous machines, robots and cobots
- Control system designs and evaluations
- Digital twins, etc.

Following the 2-day conference, the participants have been offered different industrial visits including a tour of the HRC Pilot Line at Tampere University. The participants have been introduced to the research activities performed at Tampere University in the field of human robot collaboration with large industrial robots focusing on the HRC Pilot Line which is a pre-commercial production and prototyping environment that enables learning through experimentation in new product, process and related-service development. As part of the tour, the small-scale pilots developed within ODIN have been showcased to the international participants (e.g. Germany, France, Estonia, Canada, Japan, etc.) who showed a high interest for our technologies while vivid discussions took place on the projection system and the VR training.

ODIN Videos

Over the last year we frequently uploaded videos on our YouTube channel to showcase the ODIN technologies developed. Our latest video presents the ODIN solution for the assembly of motor and gearbox parts in the Automotive pilot.

To watch the video, you can click on the image below or visit our YouTube channel:
ODIN EU Project



ODIN

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

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