

In this issue

Discover ODIN | Our latest news | 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.



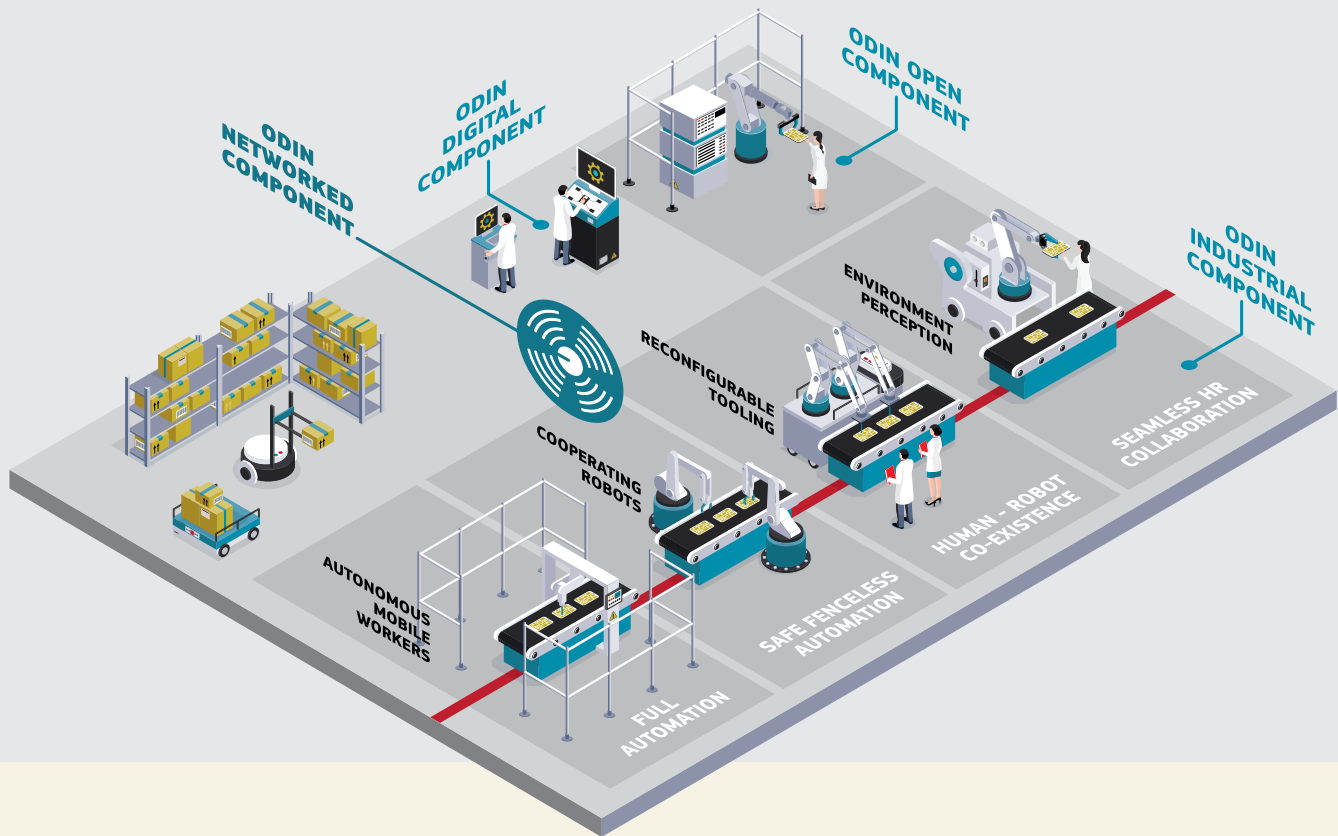
Project Overview

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”.



— READ OUR LATEST NEWS —

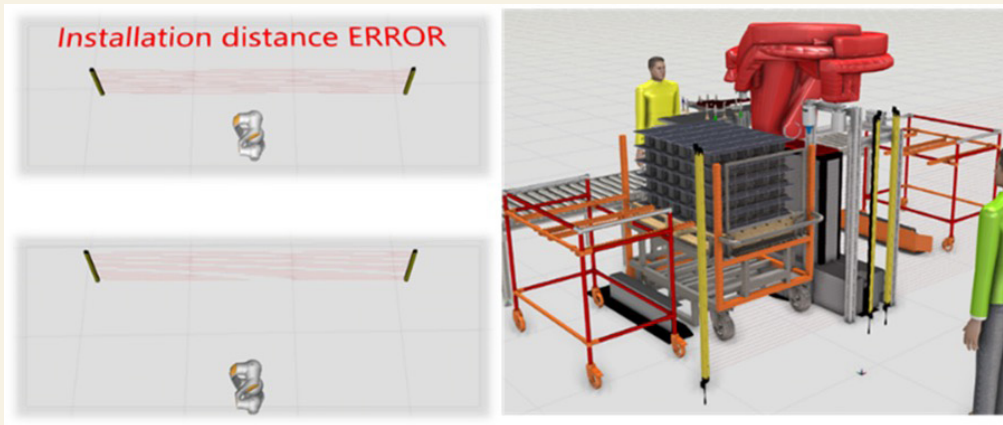
INTRODUCING NEW METHODS FOR RISK ASSESSMENT AND SAFETY VALIDATION SUPPORTED INTO DIGITAL TOOLS

The introduction of robotics in production processes is a key factor for a highly productive and competitive industry. However, although industrial robotics is a mature technology with great acceptance in large production environments, its introduction in smaller companies or in those where flexibility is an important factor, still presents some limitations, especially when talking about human-robot collaboration. Between others:

- High complexity of the design and integration of the HRC application, its safety systems and compliance with safety standards
- Feeling of low performance of collaborative operations due to safety-related constraints
- Operator acceptance and efficient integration of the operator into the workflow

In this sense, there are many initiatives and technologies under development, such as those developed by PILZ within ODIN, which are aimed at solving many of these limitations, and more specifically into reducing safety assessment and certification times

[Read the full blog post here](#)



ODIN PROJECT CELEBRATES PROMINENT JOURNAL COVERS FEATURING OUR RESEARCH PUBLICATIONS

The ODIN project is frequently publishing its results through scientific papers in conference proceedings and scientific publications in peer-reviewed journals. Amongst our various publications which are listed on our [project website](#), two of them have been selected to be featured on the covers of prestigious journals. This achievement not only underscores the project's commitment to excellence but also demonstrates the impactful contributions of the ODIN project to the scientific community. The featured articles are a testament to the high-quality research and the forward-thinking approach that the project embodies.

- The publication [A Voice-Enabled ROS2 Framework for Human-Robot Collaborative Inspection](#) was showcased in the May 2024 issue of the Applied Sciences journal. The article presents a novel voice-enabled ROS2 framework designed to enhance human-robot collaborative inspection by enabling natural language interactions for improved usability and operational efficiency in industrial settings.
- The publication [Visual Servoing Architecture of Mobile Manipulators for Precise Industrial Operations on Moving Objects](#) was showcased in the May 2024 issue of the Robotics journal. The paper builds on solid and well-established theoretical, technological, and methodological foundations to develop a practical application of mobile manipulators for precise industrial tasks involving motion.

[Read the full blog post here](#)



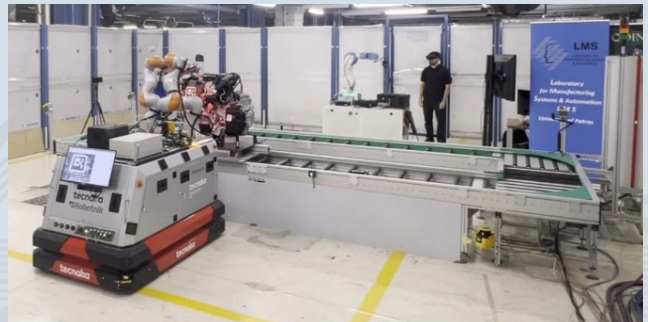
THE INDUSTRIAL WORKSHOPS

Within ODIN project we committed to organise three (3) industrial workshops targeting the Aeronautics, Automotive and White Goods sectors. The aim of these industrial workshops is to present our results and more specifically our demonstrators to a pool of industrial operators, end-users and relevant stakeholders in the targeted industries. In the previous issues of the ODIN newsletter, we presented you the first two (2) automotive industrial workshops hosted by AIC. Since then, we installed all our prototypes into industrial environments and initiated the tests and validation. As a result, we were able to organize more industrial workshops and reach a wider audience as originally planned.

AUTOMOTIVE WORKSHOP AT STELLANTIS

Following the successful installation of the ODIN automotive demonstrator at Stellantis' factory in Torino (Italy), the project organized a series of five (5) industrial workshops from the 16th to the 20th of September 2024. During the workshop series, the different technologies developed during the ODIN project were showcased to the audience and the factory personnel provided their feedback on the solution's potential and usability in an industrial environment. For the occasion, Stellantis invited the project coordinator LMS and the partner Tecnelia to join all the workshops and address the technical questions of the participants.

The partners DGH, Comau, Pilz and Roboception also participated to some the workshops bringing their specific expertise on the ODIN automotive demonstrator. The industrial participants were impressed by the flexibility of the large-scale pilot paradigm towards agile production and have great expectations for future developments leading to a fully implemented solution in factory.



AERONAUTICS WORKSHOP AT AEROTECNIC

On the 24th of October, the ODIN partners participated to the 7th and last General Assembly meeting, hosted by Aerotecnic in Cadiz, Spain. The partners addressed the final technical questions on the development of the innovative components and focused on the deployment of the demonstrators in industrial environment. To this regard, the location of our final General Assembly meeting was not trivial as the ODIN Aeronautics Pilot Line has been installed precisely at Aerotecnic Composites SL's facilities in Cadiz. Therefore, we organized an industrial workshop in conjunction of our 7th GA meeting, allowing the partners to see the aeronautics demonstrator performing the automation of three operations.



WHITE GOODS WORKSHOP AT BEKO

The third ODIN demonstrator has been successfully integrated at the Italian premises of BEKO with the support of ODIN partners. We naturally organized a series of four (4) industrial workshops on the 21st and 22nd of November 2024 and collected the feedback from either factory managers or industrial personnel. Representatives from the coordinator LMS and the partners TAU and VIS also joined the workshops interacting with the participants and exchanging on state-of-the-art technologies and solutions in the field of advanced collaborative robotics in industrial environments.



Papers in conference proceeding

- **Open-Digital-Industrial and Networking pilot lines using modular components for scalable production – ODIN project approach;** Procedia CIRP, Volume 106, 2022, Pages 162-167, ISSN 2212-8271; [DOI](#)
- **Automatic generation of realistic training data for learning parallel-jaw grasping from synthetic stereo images;** 2021 20th International Conference on Advanced Robotics (ICAR), Ljubljana, Slovenia, 2021, pp. 730-737; [DOI](#)
- **ODIN architecture enabling reconfigurable human – robot based production lines;** Procedia CIRP, Volume 107, 2022, Pages 1403-1408, ISSN 2212-8271, [DOI](#)
- **“Quality control of white goods parts using robotic technologies;** Procedia CIRP, Volume 104, 2021, Pages 1759-1764, ISSN 2212-8271; [DOI](#)
- **Visualization Concept for Representing Capability Matchmaking Results in a Virtual Environment;** Flexible Automation and Intelligent Manufacturing: The Human-Data-Technology Nexus. FAIM 2022. Lecture Notes in Mechanical Engineering. Springer, Cham.; [DOI](#)
- **Virtual reality-based safety training in human-robot collaboration scenario: User experiences testing;** AIP Conf. Proc. 29 January 2024; 2989 (1): 020002; [DOI](#)
- **A modular framework of robot gripping tools for human robot collaborative production lines;** Procedia CIRP, Volume 126, 2024, Pages 164-169, ISSN 2212-8271; [DOI](#)
- **An interactive Augmented Reality based framework assisting operators in human-robot collaborative assembly operations;** Procedia CIRP, Volume 126, 2024, Pages 170-175, ISSN 2212-8271; [DOI](#)
- **A vision-based human-robot collaborative system for digital twin;** Procedia CIRP, Volume 107, 2022, Pages 552-557, ISSN 2212-8271; [DOI](#)
- **Empowering Precision-Guided Automotive Assembly Operations: A Flexible Robot Vision Framework;** Procedia CIRP, Volume 127, 2024, Pages 50-55, ISSN 2212-8271; [DOI](#)

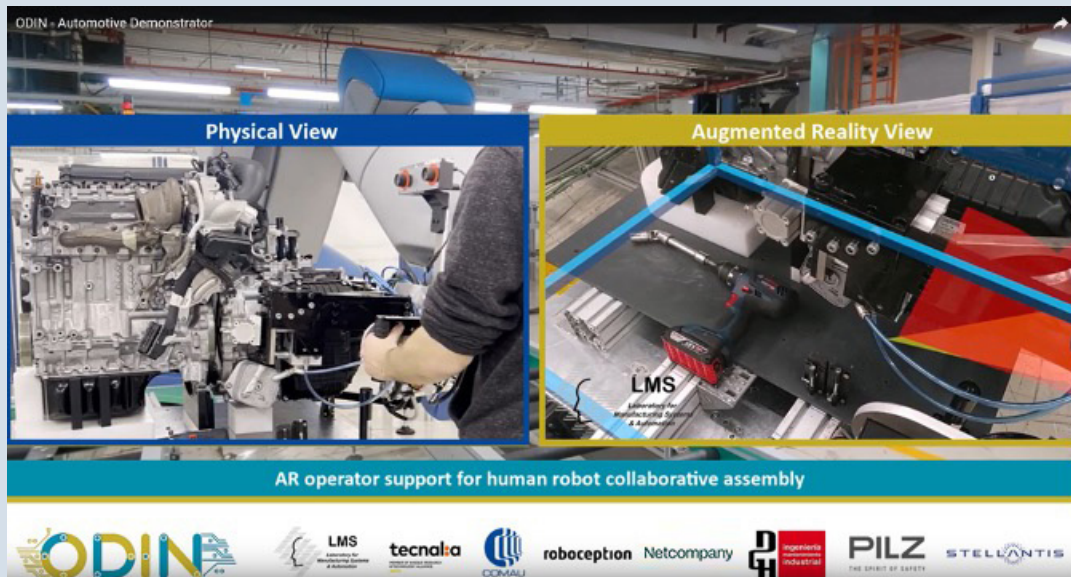
Publications in Journals

- **Data-efficient multimodal human action recognition for proactive human-robot collaborative assembly: A cross-domain few-shot learning approach;** Robotics and Computer-Integrated Manufacturing, Volume 89, 2024, 102785, ISSN 0736-5845; [DOI](#)
- **Quality control in manufacturing – review and challenges on robotic applications;** International Journal of Computer Integrated Manufacturing, 1–37; [DOI](#)
- **Safety-aware human-centric collaborative assembly;** Advanced Engineering Informatics, Volume 60, 2024, 102371, ISSN 1474-0346; [DOI](#)
- **Visual Servoing Architecture of Mobile Manipulators for Precise Industrial Operations on Moving Objects;** Robotics 2024; 13(5):71.; [DOI](#)
- **A Voice-Enabled ROS2 Framework for Human-Robot Collaborative Inspection;** Appl. Sci. 2024, 14, 4138; [DOI](#)

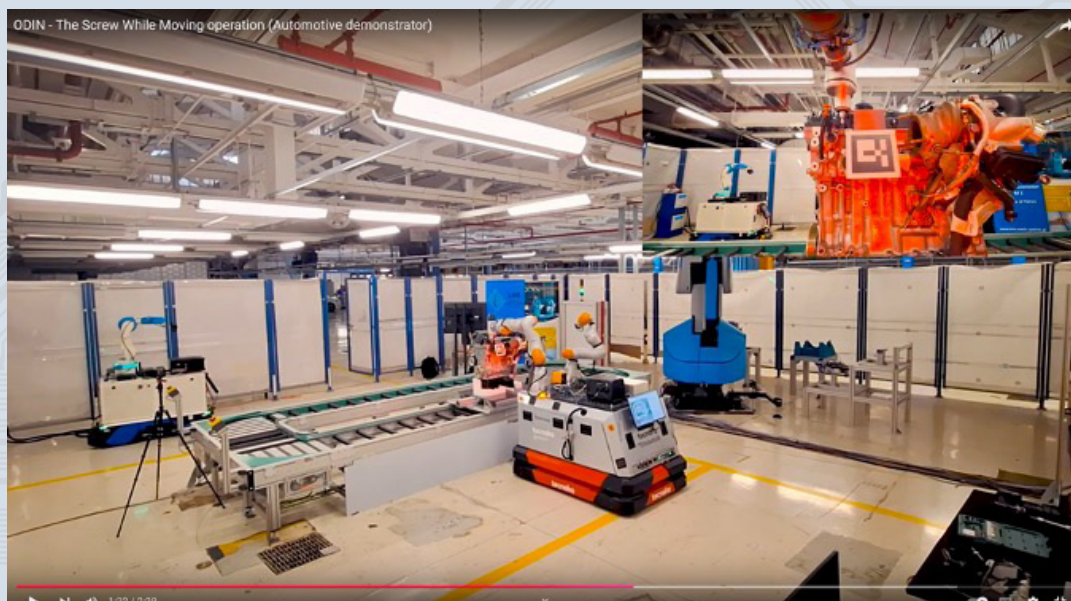
ODIN Videos

Over the last year we frequently uploaded videos on our YouTube channel to showcase the ODIN technologies developed. The published content on our YouTube channel has been very popular and it motivates us to create more content relevant for our community. The latest videos published consist in the following:

- Presentation of the ODIN Automotive demonstrator performing its three automated operations.



- The automotive demonstrator installed at Stellantis performing the Screw while Moving operation.



In you want to watch all the videos produced by the project team, visit our YouTube channel:
ODIN EU Project

GET
THE LATEST NEWS
ON **ODIN** RIGHT TO
YOUR INBOX!



www.odin-h2020.eu

ODIN

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



Follow us:

[@ODIN_EUproject](https://twitter.com/ODIN_EUproject)

[ODIN project](https://www.linkedin.com/company/ODIN-project)

[@ODINEUproject](https://www.facebook.com/ODINEUproject)

Contact us:

Project Coordinator:
Dr. Sotiris Makris, Laboratory for
Manufacturing Systems & Automation
(LMS) – University of Patras, Greece

info@odinh2020.eu

www.odin-h2020.eu



This project has received funding from the European Union's Horizon 2020 research and Innovation Programme under Grant Agreement No. 101017141