



AI-DRIVEN COGNITIVE ROBOTIC PLATFORM FOR AGILE PRODUCTION ENVIRONMENTS

ACROBA's ambition

As modern industrial robotic systems become smarter and more flexible, they are rather tailored for specific, large scale applications, making its implementation too complex and costly for smaller operators. The ACROBA project aims to develop and demonstrate a novel concept of cognitive robotic platforms based on a modular approach able to be smoothly adapted to virtually any industrial scenario applying agile manufacturing principles.

The novel industrial platform will take advantage of artificial intelligence and cognitive modules to meet personalisation requirements and enhance mass product customisation through advanced robotic systems capable of self-adapting to the different production needs.

A novel ecosystem will be built as a result of this project, enabling the fast and economic deployment of advanced robotic solutions in agile manufacturing industrial lines, especially industrial SMEs.

The ACROBA Project

The platform will depart from the **COPRA-AP reference architecture** for the design of a novel generic module-based platform easily configurable and adaptable to virtually any manufacturing line. ACROBA platform will be provided with a decentralised **ROS node-based structure** to enhance its modularity.

The Platform will serve as a cost-effective solution for a wide range of industrial sectors, both inside the consortium as well as other industrial sectors that will be addressed in the future.



ACROBA Objectives

- Design a novel platform for enabling fast and cost-efficient deployment at scale of robot systems, end effectors and sensors deployment, adaptation and operation of self- adaptive robotic solutions within agile production industrial scenarios
 - > Decrease in the time needed for the set up of an advanced industrial robotic solution
 - > Increase in integrability, reducing time and efficiency for adaptation of novel autonomous robot solutions
- Advanced training and transfer learning agile mechanisms to provide autonomous robot solutions with enhanced cognitive capabilities
 - > Reduction of robot programming time
 - > Reduction of commissioning time
 - > Reduction in Software Engineering
- Validate ACROBA platform in large scale agile production scenarios
- Ensure knowledge transfer and reach out to agile production industry stakeholders

ACROBA industrial scenarios

The potential of ACROBA platform, as a step forward for the cost-efficient setup and operation of diverse manufacturing industries within agile production environments, will be demonstrated by means of five distinctive large-scale industrial scenarios.

Autonomous robotic solution applied to :

- Additive manufacturing for medical devices production: automation of manual process (STERIPACK)
- Plastic manufacturing pilot lines for large part finishing: Plastic pallets (CABKA Group) and Large containers lids (MOSES)

Robotic solution collaborating with human applied to:

- Electric components assembly for electric motors manufacturing: automation of most manual intensive tasks, in a flexible process adapted to various component and a wide range of products (ICPE).
- Electronic elements assembly for electronic circuits production: automation of small and large customized series (IKOR)

ACROBA Consortium

With 17 entities from 9 countries, the ACROBA consortium gathers complementary high-level expertises and covers the entire value chain of robotic automation for agile production in industrial companies.

SMEs are the major players in ACROBA project, supporting their uptake of novel intelligent technology, with seven industrial SMEs in the partnership, four of them being end users. In addition, to the SMEs, ACROBA consortium also gather one Large Industry, five Research Centers, two Universities and two Clusters.

ACROBA other activities

In addition to the 5 demonstrators that will be developed during the project, the potential of the ACROBA platform will be demonstrated through two extra mechanism involving external actors:

Organisation of Hackathons

11 mini hackathons will be organised between mid-2022 and end of 2023. In 2024, all finalists will compete in the final master hackathon

Hackathons runners will build a 'proof of concept' and a minimum viable product for a specific predefined manufacturing problem identified as requiring an agile production solution. Each contest will result in several functional basic applications of a robotic system powered under ACROBA platform..

ACROBA On-Site Labs:

2 selected SMEs will be supported in the implementation of a robotics solution (powered under the ACROBA platform) to answer a current manufacturing problem they are facing on their Digital Transformation journey.



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