ROB4GREEN

Robotics and AI as Enablers for Greener Dismantling, Remanufacturing and Recycling
-ROB4GREEN-

PRESS RELEASE

ROB4GREEN is a European research project funded under the Horizon Europe program, focused on developing AI-enabled collaborative robotic solutions to support greener remanufacturing and recycling processes. By enhancing flexibility and cognition in robotic systems, ROB4GREEN will enable industries to adopt more sustainable practices aligned with the objectives of the European Green Deal.

The ROB4GREEN consortium, coordinated by the Laboratory for Manufacturing Systems and Automation (LMS), brings together 11 partners, including research institutes, technology developers, and major industrial stakeholders. Through pilots in the automotive, electronics, and renewable energy sectors, the project aims to demonstrate how AI, Data and Robotics can boost circular economy strategies.

ROB4GREEN Project Reaches Major Milestone with the definition of its Hardware and Software Reference Architecture

The ROB4GREEN project is proud to announce the successful completion of a key milestone: the definition of its Reference Architecture and the establishment of comprehensive hardware and software specifications. This achievement provides a solid, modular foundation for the upcoming development and integration phases of the project, which aims to revolutionize greener dismantling, remanufacturing, and recycling (Re-X) through AI and robotics.

A SOLID FOUNDATION FOR CIRCULAR MANUFACTURING

The newly defined ROB4GREEN reference architecture is designed to be modular, interoperable, and sustainable. By establishing these guidelines early, the project ensures that diverse technological components, ranging from robotic controllers to advanced AI perception modules, can interact seamlessly across different industrial sectors.

"The completion of this architecture is more than just a technical report; it is the blueprint for our entire ecosystem," said Konstantinos Kavvathas, software engineer from NetCompany. "It enables us to move from theory to the development of real-world prototypes that will handle complex materials like windmill blades, used tires, and electronic scrap with unprecedented precision."

The architecture leverages a suite of "Technology Blocks" including AI-driven perception for material analysis, adaptive human-robot task scheduling, and Smart Digital Twins featuring Digital Product Passports (DPP). These are complemented by multi-modal AR/XR interfaces and specialized hardware to ensure precise, energy-efficient recycling operations.

Designed for openness and extensibility, this framework is a cornerstone of the project's Financial Support to Third Parties (FSTP) program. By utilizing standardized protocols like OPC UA and MQTT, the architecture enables external SMEs and developers to seamlessly integrate their own solutions during upcoming Open Call cycles, ensuring high portability and broad industrial impact.

PROJECT PROGRESS AND MILESTONES

ROB4GREEN has successfully concluded its first reporting period (Month 12), marking an important milestone in the project's implementation. The project's progress, technical achievements, and strategic direction were presented and positively evaluated during the first Review Meeting with the European Commission, confirming that the project is advancing according to plan and meeting its objectives. This successful review establishes a solid foundation for the next phases of the project, which will focus on further technology development, integration, and large-scale validation in industrial use cases.

WHAT'S NEXT?

With the architecture finalized, the consortium is now moving into the development of first prototypes, expected by Month 18. These technologies will eventually be validated in three large-scale industrial pilots.