RE-PAIR

Robot-Enhanced station with augmentedrealityProjected user interface for Inspection in Remanufacturing

RE-PAIR provides a collaborative AI-powered robotic inspection solution that enables faster, more objective, and easily reconfigurable quality inspection for industrial remanufacturing.

THE CHALLENGE AND WHY IT MATTERS

Remanufacturing requires accurateinspection to determinewhether returned components can be reused. Current manual procedures are time-consuming, operator-dependent and difficult to standardize, leading to higher costs, inconsistent quality and limited scalability of remanufacturing operations.

OUR SOLUTION AND VALUE PROPOSITION

RE-PAIRdelivers acollaborative robotic inspection stationvalidated in a real industrial environment at Bonfiglioli. The system allows operators to configure new inspection routines by manually guiding a collaborative robot, after which the robot autonomously repeats the inspection, detects defects using AI-based vision algorithms, projects the results directly onto the component through augmented reality, and automatically generates a digital inspection report. By combining collaborative robotics, artificial intelligence and AR, the solution reduces inspection time, improves detection consistency and traceability, simplifies system reconfiguration, and supports operators in making faster and more objective quality decisions during remanufacturing.

ADDED VALUE FROM JARVIS

RE-PAIRintegrated the JARVISRobot Trajectory and Path Planning Interfaces and AR Projector Interfaces for Operator Commands and Awareness. Together, they enabled safe robot navigation between inspection points and intuitive projection of visual guidance directly onto components, improving operator interaction, reducing cognitive workload, and accelerating the inspection process.

KEY RESULTS

- √ Validated acollaborative robotic inspection station at TRL7 in Bonfiglioli's industrial environment.
- √ Reduced reconfiguration and programming time by up to 70%.
- √ Reduced inspection cycle time by up to 80% compared with the conventional manual inspection process.

PILOT AT A GLANCE

Leadorganization: Deep VisionConsulting (DVC)
Consortium: Deep Vision Consulting (DVC), Bonfiglioli Riduttori S.p.A.
Sector / use case: AI-assistedquality inspectionforremanufacturing of forklift axles
JARVIS module(s): Robot Trajectory and Path Planning Interfaces; AR Projector Interfaces for Operator Commands and Awareness
Demonstration environment: Bonfiglioli industrial remanufacturing facility (real operational environment, TRL7 validation)

POTENTIAL MARKET OPPORTUNITIES

RE-PAIR targets OEMsand remanufacturing companies seeking to automate quality inspection of mechanical components. Beyond forklift axles, the solution can be adapted to different product geometries and industrial sectors, supporting scalable inspection services and future commercial deployment as a configurable inspection platform.

MORE INFORMATION

Website: https://deepvisionconsulting.com/
Contact: Francesco Baraldi – francesco.baraldi@deepvisionconsulting.com
Videos: https://www.youtube.com/@JARVISHorizonEuropeProject

Funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement nº 101135708. The dissemination of results herein reflects only the author's view, and the European