JARVIS

DRIVING HUMAN-ROBOT COLLABORATION: ARIES

Funded by the European Union

This project has received funding from the European Union's Horizon Europe programme

Project name

ARIES - **A**ugmented **R**eality-**E**nhanced **R**obotic **I**nspection of **E**lectrical **S**ubstations

Introduce your pilot project in a few sentences (What problem are you addressing? What is your solution or approach? What makes it innovative or impactful?):

Our pilot, ARIES, focuses on enhancing robotic inspections in Extra High Voltage Centres using virtual reality and augmented reality. The goal is to enable remote, condition-based inspections that are safer, faster, and more precise. Operators use a VR headset to control a robot that streams live 360° video and overlays real-time component data. This shift from time-based to data-driven maintenance helps reduce downtime, avoid unnecessary travel, and ensure early detection of equipment faults.

How does your work align with the goals or methodology of JARVIS?

ARIES directly supports the JARVIS mission of advancing human-robot collaboration through intuitive, user-centred interaction. JARVIS promotes AI-enhanced tools that lower the barriers to robot adoption. In our case, we use VR and shared-control navigation to allow operators to interact naturally while the system ensures safety and stability. By integrating JARVIS modules for tele-operation and AR projection, we're validating this human-in-the-loop methodology in a high-risk, real-world setting.

Briefly outline the upcoming focus or next milestones in the pilot's development:

We've completed the requirements phase and are now entering development. The next steps include building the VR interface, implementing AR overlays, and integrating the robot's control system. We'll begin with lab testing, fine-tune usability, and then move on to real-world validation at an IPTO Extra High Voltage Centre. Our priority is to ensure the system performs reliably in the field and meets the needs of operators under real operational conditions.

How does your solution advance Human-Robot Collaboration in a user-centric manner?

The ARIES system is designed around the operator experience. Instead of complex controls, users navigate using natural head movement and simple gestures. The robot handles terrain safety and fine adjustments, so the operator can focus on inspection decisions. Augmented reality overlays show component status and history right in the VR view, reducing mental effort and improving situational awareness. This approach makes the robot a supportive partner, not a burden, and that's key to real collaboration.

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