

TELEWELDER – Teleoperation for welders

Develop a safe, immersive, and efficient remote welding system enabling operators to perform precise welding tasks from a secure supervision environment, while a robotic manipulator executes the operations inside constrained and hazardous work areas.

THE CHALLENGE AND WHY IT MATTERS

Welding operations in shipbuilding are often performed in confined, hot, and hazardous environments exposing operators to fumes, difficult postures, and safety risks. These conditions impact worker health, productivity, and weld quality. The industry needs solutions that preserve welder expertise while significantly reducing exposure to harsh environments.

OUR SOLUTION AND VALUE PROPOSITION

TELEWELDER combines immersive virtual reality, digital twin technology, real-time robot teleoperation, environment scanning, and virtual welding guides. Welders remotely control a UR10e robotic arm equipped with a welding torch while receiving stereoscopic visual feedback through a VR headset. A 3D scan of the workspace is integrated into the digital twin to prevent collisions, while virtual guides assist weld trajectory execution. The solution enables safer operations, improved operator comfort, higher productivity, and more consistent weld quality without removing the welder from the decision-making loop.

ADDED VALUE FROM JARVIS

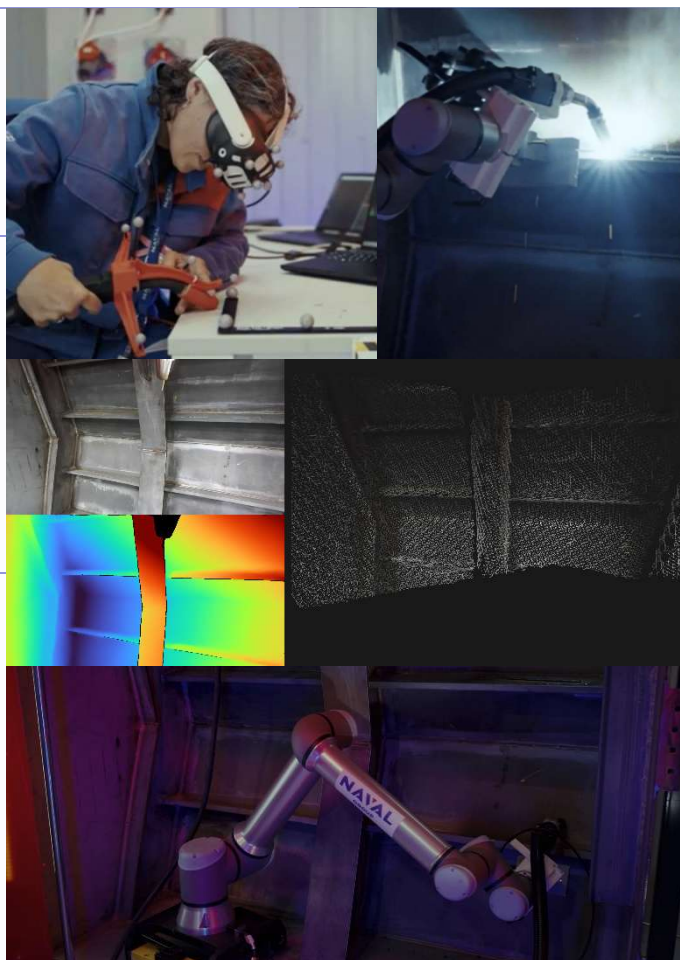
- Digital representation: The XSM3 engine is now integrated into the INTERACT solution developed and distributed by LS GROUP. XSM3 enables the detection of collisions between the robot and itself, as well as with its environment. The speed and acceleration parameters of the physical robot are simulated in the digital twin.
- Teleoperation of robotic manipulators: The use of XSM3 for this tool was also essential for creating virtual guides that help the welder work with precision. The tracking system faithfully reproduces the torch's movements. XSM3 performs inverse kinematics calculations, taking into account all collision constraints and virtual guides.

KEY RESULTS

- ✓ Demonstrated a TRL7 teleoperated welding system in representative industrial conditions.
- ✓ Achieved an average 90% reduction in operator exposure to harsh environments, exceeding the initial 50% target.
- ✓ Achieved a 62% reduction in welding cycle time, surpassing the initial 40% target.

POTENTIAL MARKET OPPORTUNITIES

TELEWELDER is a strong industrial reference demonstrating INTERACT's flexibility, to sell and extend INTERACT licenses and associated services for Naval Group and other industrial customers. The next step for the solution TELEWELDER will be to convince Naval Group internally of the merits of this solution to secure funding to scale it up for deployment across several Naval Group sites. Building this internal case will require demonstrating that the occupational health and safety (OHS) gains are achieved while maintaining welding quality.



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PILOT AT A GLANCE

Lead organization: LS GROUP

Consortium: LS GROUP and Naval Group

Sector / use case: Shipbuilding and industrial welding in constrained environments

JARVIS module(s): Digital representation / Teleoperation of robotic manipulators

Demonstration environment: Test conducted on a section of a boat hull

MORE INFORMATION

Website: [TELEWELDER – Teleoperation for welders](#)

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Videos: <https://www.youtube.com/@JARVISHorizonEuropeProject>



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