LEVER

Leveraging human-robot collaboration for flexible heavy-lifting

LEVER by Progressive Robotics is one of the 5 selected during the **EARASHI Open Call 2**. It introduces a novel solution that makes any robot truly collaborative. Transforms it into a powerful tool, it assists the workers in heavy lifting and co-manipulation, reducing musculoskeletal disorders and improving overall working conditions. The project aims to develop and integrate compliance control algorithms and sensorized smart handles into high-payload robots. LEVER's innovative approach addresses the challenges of heavy object manipulation, emphasizing on human well-being, and aiming to make human-robot collaboration in assembly and disassembly more effective and safe.

CHALLENGES

LEVER aims to assist workers in assembly and dissasembly operations of heavy objects, addressing the following aspects:

- Safe collaboration with industrial robots
- Effective and precise hand-guidance
- Maximise compatibility with different hardware
- Facilitate heavy object manipulation
- Reduce burden in heavy operations

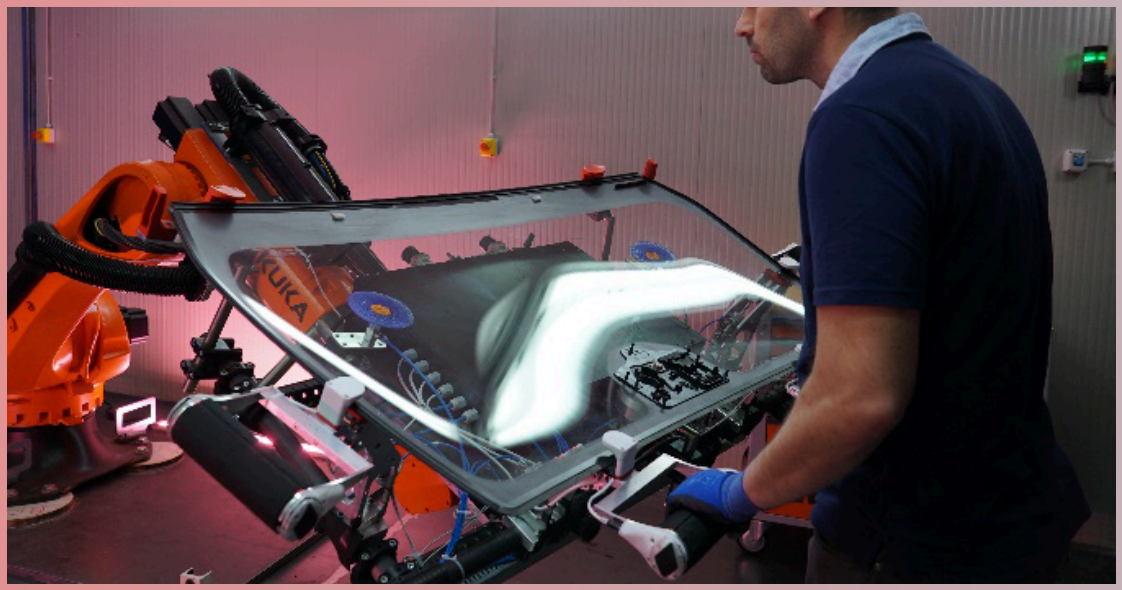
SOLUTIONS

Variable compliance control under uncertainties

Robot's inertia reduction

Smart handles as enabling devices

Distinction of voluntary from involuntary contacts



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IMPACT

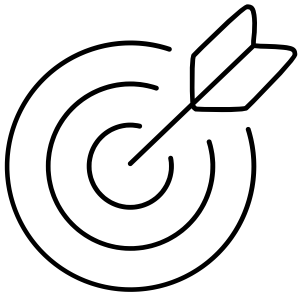
#1: Decrease of the number of workers that perceive stress at work / the number of accidents at work / number of workers already suffering from MSD

#2: Increase of the number of ROS-users

#3: Improvement of trust in Robotics

#4: Machine retrofit and refurbishment

#5: Standardized, easy, non-hazardous dismantling processes shortened in time and costs



MAIN GOALS

- Reduce physical strain
- Worker well-being
- Effective human-robot collaboration
- Pilot Demonstration and Validation

KEY NUMBERS

90% reduction of apparent robot's inertia

99.9% contact distinction accuracy

2 pilots in real-world assembly & disassembly application

10 workers validate the technology

25% task completion time improvement

Through LEVER we aim to further develop a technology that has already reached TRL5. By including effective robotic hand-guidance and safe collaboration through smart handles, we plan to further advance the robustness level of the product and reach commercial scale, to eventually empower workers in factories for assembly and dissasembly operations.

The financial support by the EU and the services that are provided by the Earashi consortiium, are essential to bring LEVER project to life, facilitating the research and development of human-robot collaboration and allowing for the practical implementation and testing of these technologies in real-world settings.

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