

POSTAIR

**Safe and Trusted Human Centric Artificial Intelligence
in Future Manufacturing Lines**

Enabling SAFE, SECURE and ETHICAL AI in Manufacturing

STAR researches, develops, validates, and make available to the community leading edge AI technologies with wide applicability in manufacturing environments:

Explainable AI

Why did you do this?

- Explain to Factory Workers and Quality Engineers the rules and principles of the AI systems operation
- Increasing Transparency and Trust on AI Systems

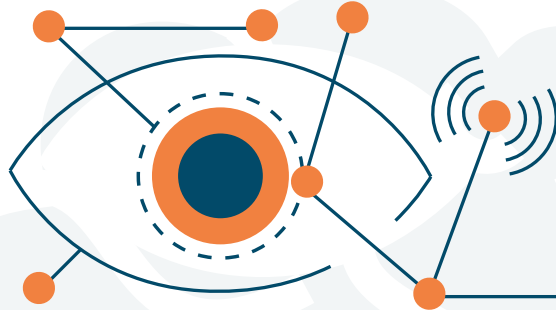
Active Learning

Robot-to-Human: Is this piece defected?

- Query human where not sure what to do next!
- Accelerate Knowledge Acquisition for AI

(Cyber) Security for AI Systems

Protection of AI Systems against Adversarial Attacks



Human-Centric Digital Twins

What-if-Analysis with the Human-in-Loop?

- Simulation & Detection of Safety Issues
- Optimal Deployment of Automated Mobile Robots
- Detection of Safety Zones

Simulated Reality

Shorten Reinforcement Learning Cycle

- Simulate the next actions of Reinforcement Learning than expecting convergence

These technologies will be validated in challenging scenarios in manufacturing lines, in the areas of quality management, human robot collaboration and AI-based agile manufacturing

The challenge

Artificial intelligence (AI) systems in the manufacturing sector are increasingly replacing human tasks improving the automation of production. These systems need to be safe, trusted and secure, even when operating in dynamic, unstructured and unpredictable environments to be able to react to different situations and security threats. Ensuring the safety and reliability of these systems is a key prerequisite for deploying them at scale and for fully leveraging the benefits of AI in manufacturing.

Challenges for AI in Industrial Systems:

- Transparency and Explainability
- Slow and Hazardous Interactions between AI Systems and Manufacturing Environment
- Human Centric AI Systems i.e. AI, Humans, Robots must co-exist in Industrial Plants
- New Opportunities for AI (Cyber) Security Attacks
- Inaccuracy and Unreliability of Industrial Data

Discover STAR

STAR, a joint effort of AI and digital manufacturing experts, aims to deploy standard-based secure, safe, reliable and trusted human centric AI systems.

STAR researches, develops, validates and makes available to the AI and Industry4.0 communities novel technologies that enable AI systems to acquire knowledge in order to take timely and safe decisions in dynamic and unpredictable environments, including: Explainable AI, Active Learning and Simulated Reality for fast, safe and efficient online learning and knowledge acquisition, Human Centric Digital Twins, and Security for AI systems.

These technologies will be validated in challenging scenarios in manufacturing lines, in the areas of quality management, human-robot collaboration and AI-based agile manufacturing. The project's results will be fully integrated into existing EU-wide Industry 4.0 and AI initiatives (notably [EFFRA](#) and [AI4EU](#)), as a means of enabling researchers and the European industry to deploy and fully leverage advanced AI solutions in manufacturing lines.

Use Cases



Human-Robot Collaboration

Human-Cobot Collaboration for Robust Quality Inspections

PHILIPS – Netherlands



Secure AI

Human Centred Artificial Intelligence for Agile Manufacturing 4.0

IBER – OLEFF – Portugal



Safety with AI

Human Behaviour Prediction and Safe Zone Detection for Routing

DFKI - Germany

Impact

- Increased intelligence & flexibility in production lines
- Safe human-robot collaboration at scale
- Faster uptake of AI solutions (Quality4.0, Cobots)
- Ethical impact in manufacturing in line with HLEG recommendations
- Research (e.g. Simulated Reality, Active Learning, Explainable AI) placing EU at the forefront of global AI R&D

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R2M
SOLUTION



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 956573

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