

# CONVERGING

Social industrial collaborative environments  
integrating AI, Big Data and Robotics for smart manufacturing

## Discover CONVERGING



### CONVERGING vision

The CONVERGING project aims to Develop, deploy, validate and promote smart and reconfigurable production systems including multiple autonomous agents (collaborative robots, AGVs, humans) that are able to act in diverse production environments.

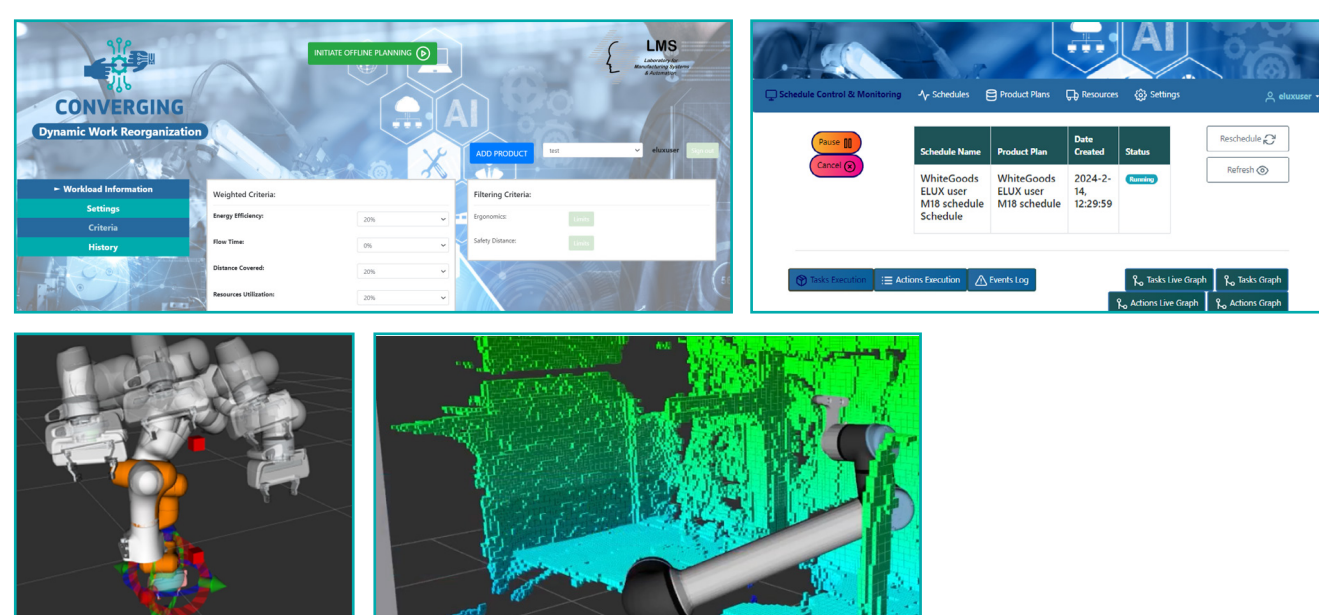


CONVERGING is redefining smart manufacturing through AI-driven reconfiguration, real-time decision-making, and human-robot collaboration. The modules presented below are contributing to the future of smart manufacturing and enable AI-driven reconfiguration, real-time decision-making, and seamless interaction between humans and machines, ensuring a safe, adaptive.

## Key Innovations

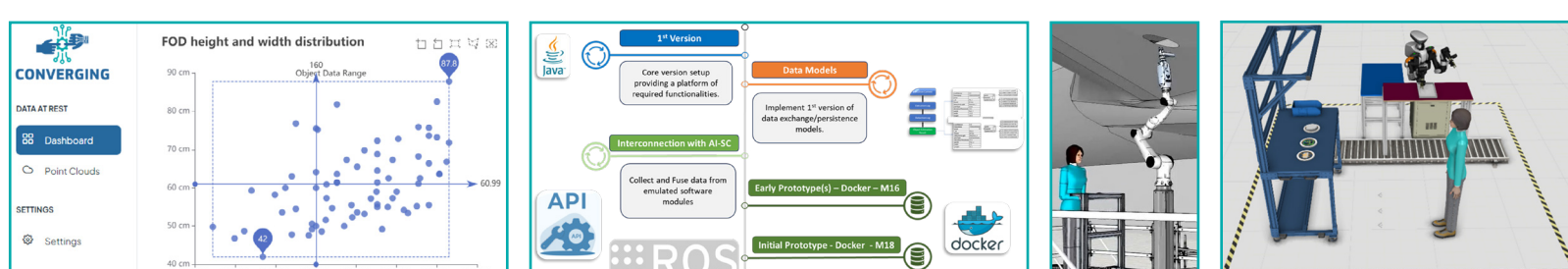
### AI-Driven Reconfiguration & Autonomy

- **Dynamic Work Reorganization (DWR):** AI-powered task scheduling for human and robotic collaboration.
- **AI Station Controller (AISC):** Real-time robotic production orchestration.
- **Collaborative Robot Control (CRC):** Smart robots with collision avoidance & task-switching.
- **Perception & Autonomy (PAM):** AI-enhanced vision & decision-making for robots.



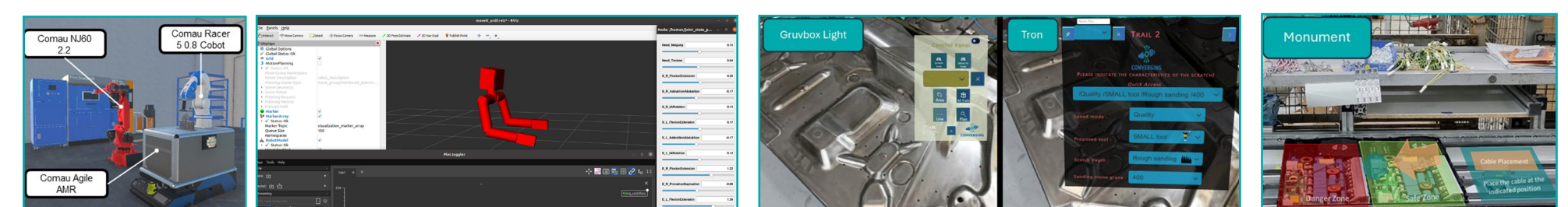
### Big Data Pipeline for Smart Factories

- **Data at Rest (DAR):** Seamless data sharing through microservices.
- **Data In Motion (DIM):** Real-time data exchange between Human-Robot Collaboration (HRC) agents.
- **AI Digital Twin (AIDT):** Virtual shop floor models for predictive insights & efficiency.



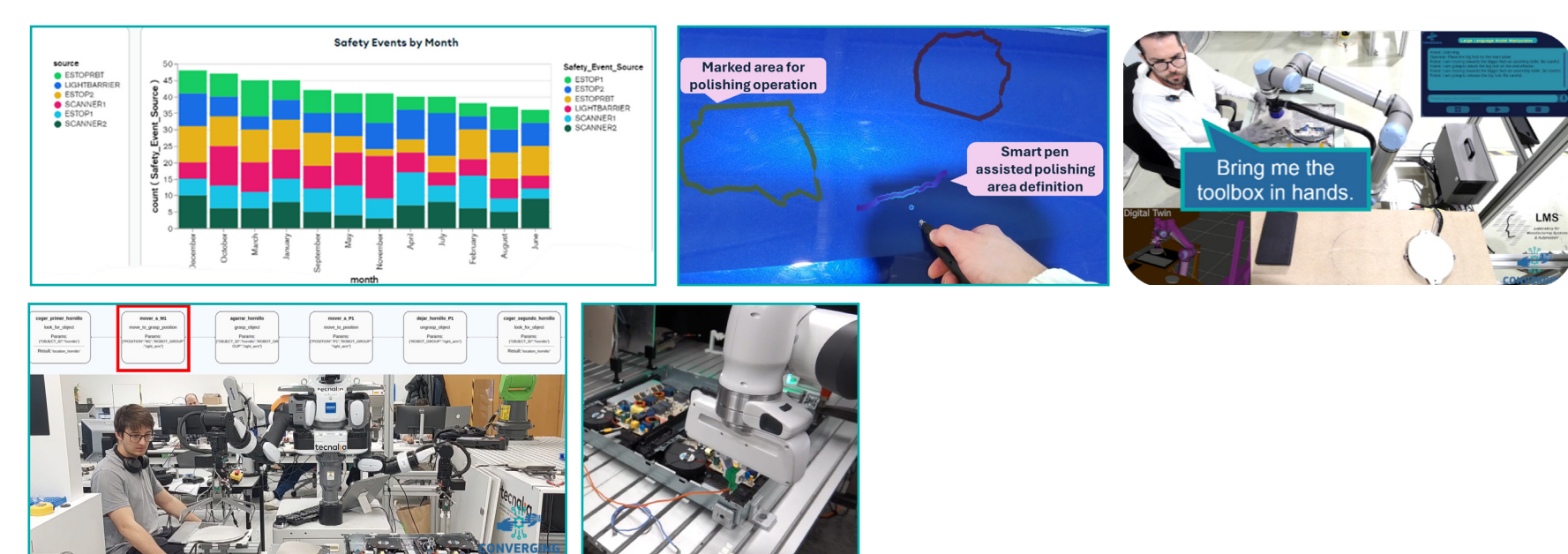
### Human-Centric Industrial Environments

- **Operator Training (OTM):** Immersive AR, VR & MR training for workforce upskilling.
- **User Experience & Ergonomics (UXE):** Human-centered robot task optimization.
- **Multi-Actor Contextual Interfaces (MACI):** Customizable, voice-enabled, and AR-powered interfaces for seamless human-machine collaboration.



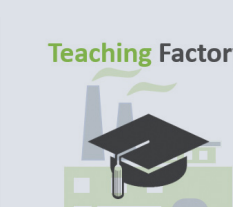
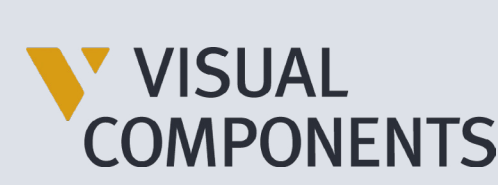
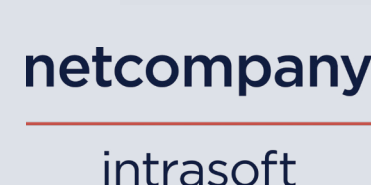
### Smart Human-Robot Collaboration

- **Safety Assessment & Monitoring (SAM):** AI-driven risk detection & accident prevention.
- **Multi-Actor Contextual Interfaces (MACI):** Advanced Human-Robot Interaction (HRI) with customizable interfaces, voice commands, and AR/VR integration for seamless communication.
- **Teaching by Demonstration (TDM):** Robots learning tasks through human demonstrations.
- **Autonomous Robot Behavior Adjustment (ARBA):** Self-learning robots for real-time process adaptation.



## Why CONVERGING?

- **AI-Driven Smart Factories:** Automating complex workflows & predictive decision-making.
- **Enhanced Human-Robot Collaboration:** Safer, intuitive manufacturing environments.
- **Future-Proof Workforce:** AR/VR-powered training & easy robot integration.
- **Scalable & Modular Industry 4.0 Solutions:** Adaptable across diverse manufacturing needs.



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