MADE IN EUROPE 2026

ONLINE PITCHING

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Institution overview

Aalto University

Aalto-yliopisto
Aalto-universitetet
Aalto University

Aalto University is the **2nd largest university in Finland.**

3 Finnish universities merged in 2010: the Helsinki University of Technology, the Helsinki School of Economics and the University of Art and Design Helsinki.

Six schools with close to 17,500 students and 4,000 staff members,

485++ signed EU funded projects

Very strategic position in AI

- *Part of EU AI Factory – LUMI AI Factory*
- *Part of Finnish AI Region (FAIR) European Digital Innovation Hub*
- *Finnish Quantum Computing Infrastructure (FiQCI)*

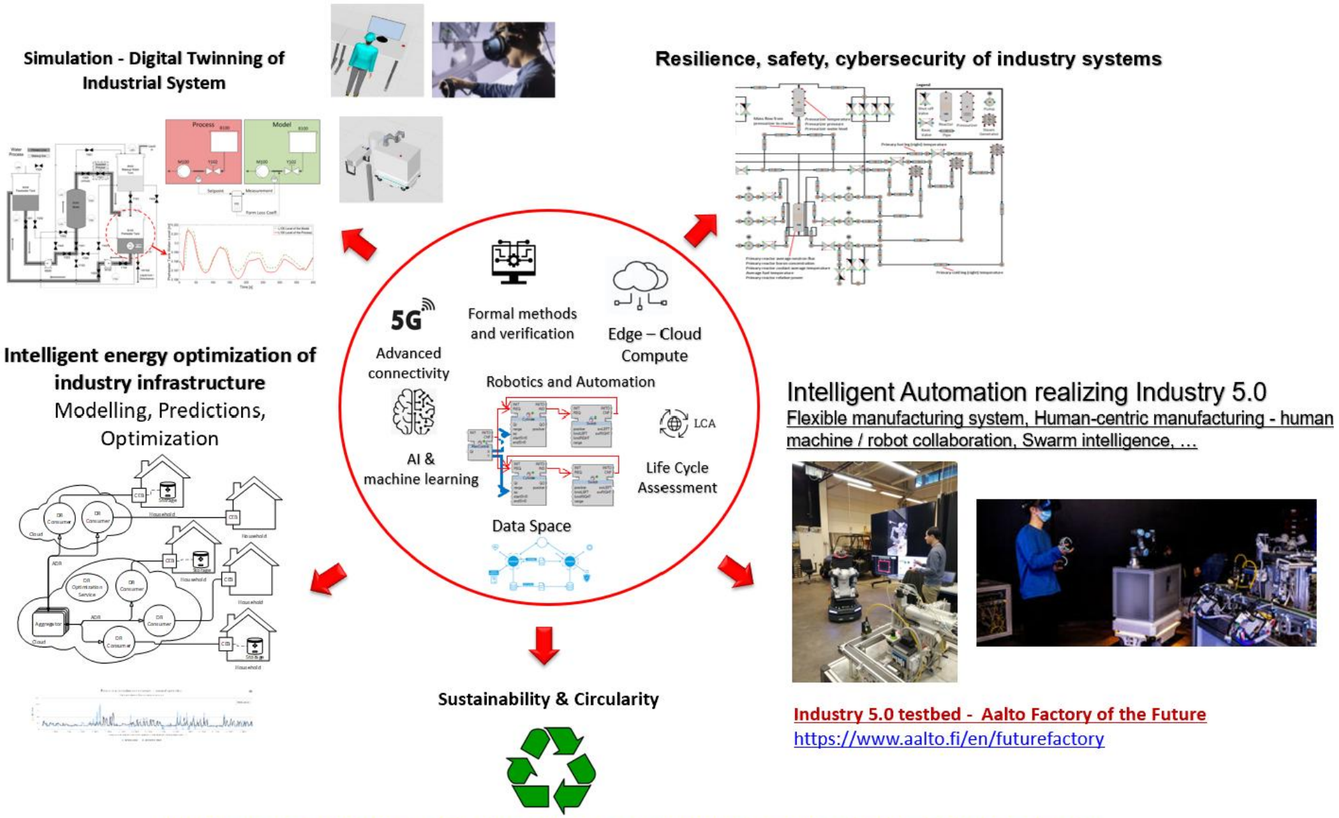
LUMI AI Factory

FAIR Finnish AI Region | EDIH

FiQCI

Information Technology in Automation group

Aalto-yliopisto
Aalto-universitetet
Aalto University



https://www.aalto.fi/en/department-of-electrical-engineering-and-automation/information-technologies-in-industrial-automation

- Robotics and automation technologies: decentralized/distributed automation (swarm, multi agent systems – IEC 61131-3, IEC 61499, ROS/ROS2, …)
- Energy optimization
- Machine learning approaches
- Human-robot collaboration
- Digital twins

- Safety – risk- threat analysis, formal methods and verification, hazard analysis of complex systems
- agentic techniques in industrial applications
- Resilience – dependability, cybersecurity approaches in industrial applications

Example Projects

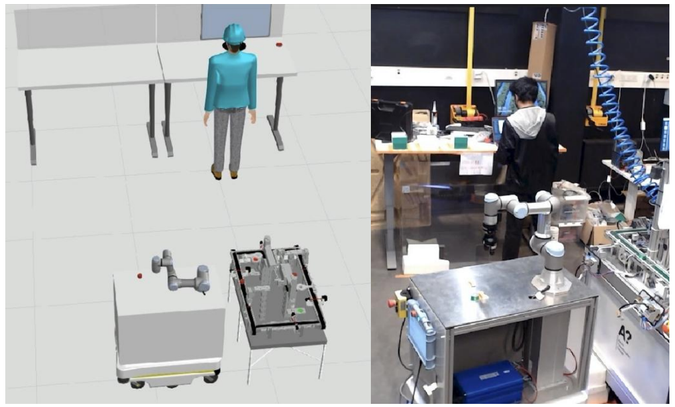
ZEROSWARM
MIXIOR LABS
ARROWHEAD fPVN
MNEST
Self-Made
TRAIN ME
Power LIFT
SEASHIINE
Reboot IoT Factory
CloVic
seed
Upraise DIGITAL SKILLS X VIRTUAL WORLDS
TwinFlow

CAFE – Conscious Agent for Collaborative Factory of the Future

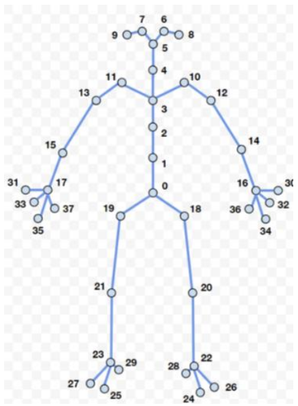
D-Crisp

CALL TOPIC HORIZON-CL4-2027-01-DIGITAL-EMERGING-52 - New approaches for Human/AI collaboration for the workforce of the future

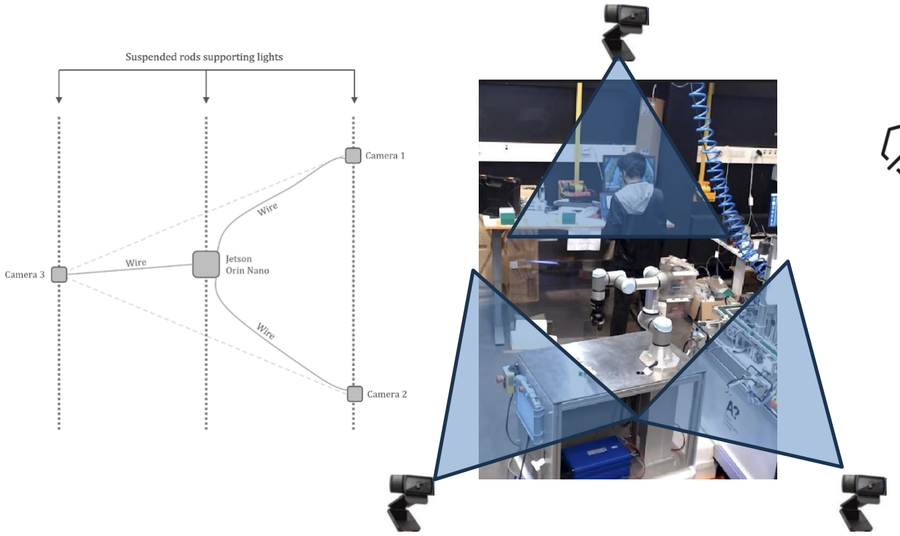
Related Development – Human Digital Twin for human factor analytics



Human digital twin



Skeletal tracking



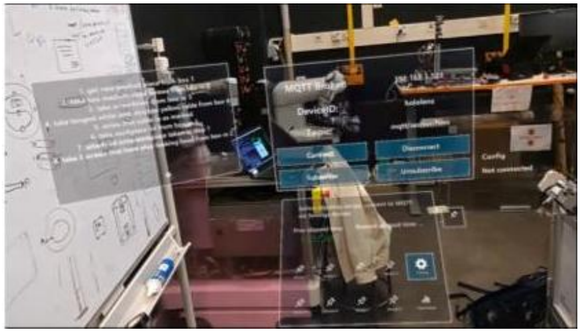
Multi-cam system to capture

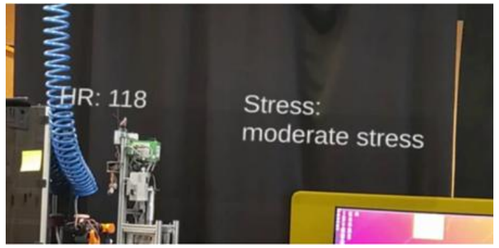
Relevant Projects

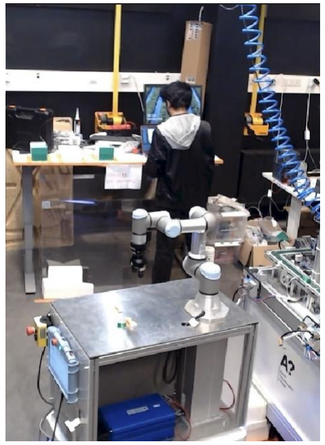
- Building accurate model of human in industrial environment – capture and emulate behavior for simulation and AI training (e.g., predict and anticipate human movement, assess ergonomics)
- Motion capture, skeletal tracking through edge processing for respecting privacy

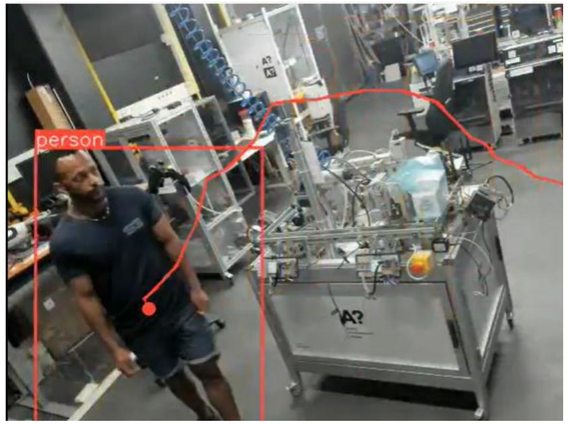
CALL TOPIC HORIZON-CL4-2027-01-DIGITAL-EMERGING-52 - New approaches for Human/AI collaboration for the workforce of the future

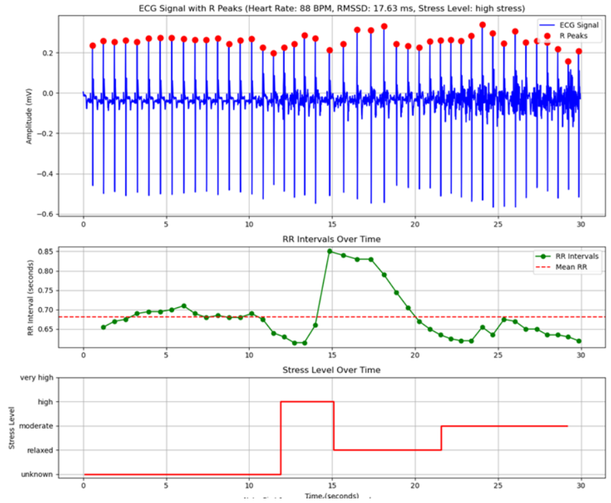
Related Development – Multimodal human machine collaboration











Relevant Projects

ZEROSWARM

TwinFlow

TRAIN ME

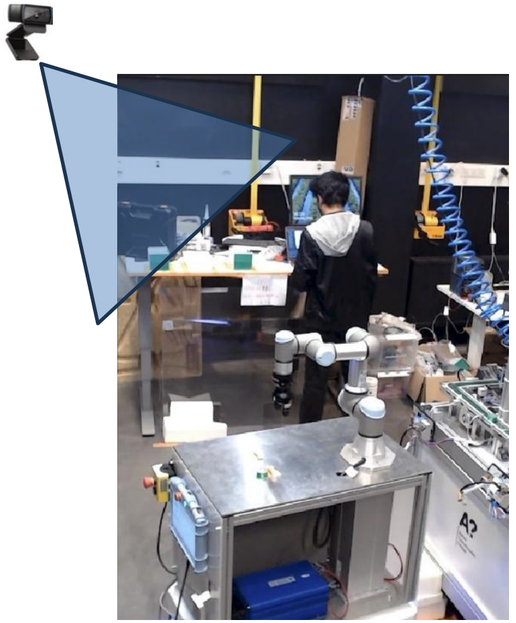
iUpraise
DIGITAL SKILLS X VIRTUAL WORLDS

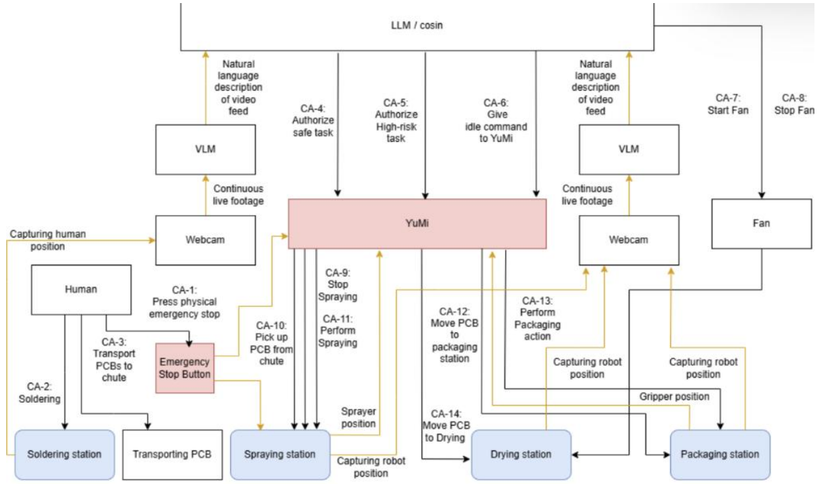
CAFE – Conscious Agent for Collaborative Factory of the Future

- Generic framework, data pipeline and processing for multimodal human robot collaboration – physiological state (stress level), voice, gesture, “positional movement” with Augmented reality / extended reality interface
- Adaptive human centric task allocation between human and robot based on runtime stress level assessment
- On premise / edge SLM (small language model) to capture human intent via speech while respecting privacy

CALL TOPIC HORIZON-CL4-2027-01-DIGITAL-EMERGING-52 - New approaches for Human/AI collaboration for the workforce of the future

Related Development – human robot collaboration in electronics manufacturing with on-the-fly safety framework





Relevant Projects

TwinFlow

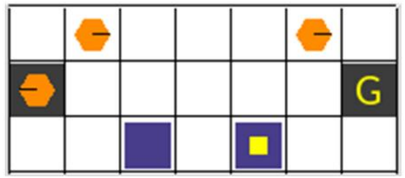
iUpraise
DIGITAL SKILLS X VIRTUAL WORLDS

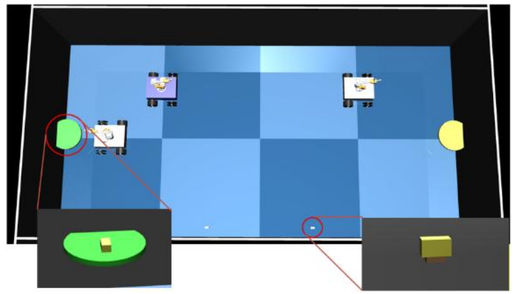
CAFE – Conscious Agent for Collaborative Factory of the Future

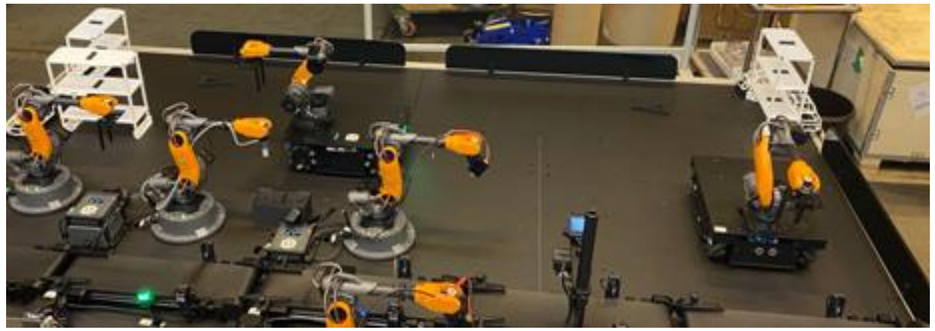
- Premise : safety measures in human robot/AI collaboration are usually passive and reactive
- Our proposition : Active safety -- Systems theoretic process analysis as a framework for safety constraints, risk and hazard identification and assessment – unsafe actions, “loss scenarios”
- On premise Vision Language Model / VLM to assess human behavior, predict safety events in human robot collaboration scenarios

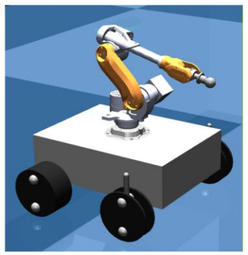
CALL TOPIC HORIZON-CL4-2027-01-DIGITAL-EMERGING-52 - New approaches for Human/AI collaboration for the workforce of the future

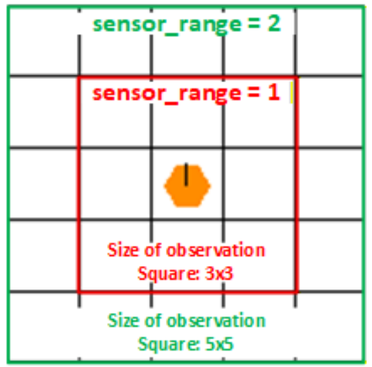
Related Development – Multi actor collaborative safety in industrial environment











- Premise : safety measures are usually passive and reactive
- Our proposition: Active safety - Collaborative safety - collision avoidance between multi-actors operating in shared industrial environment
- Multi agent decentralized learning towards safe mixed fleet (human – robot) environment

Relevant Projects

TwinFlow

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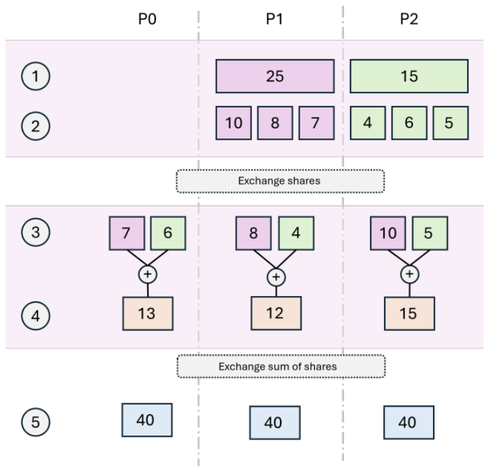
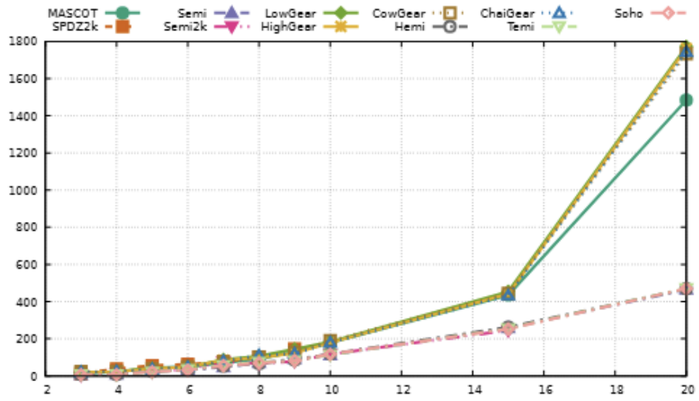
DIGITAL SKILLS X VIRTUAL WORLDS

CAFE – Conscious Agent for Collaborative Factory of the Future

CALL TOPIC HORIZON-CL4-2027-01-DIGITAL-EMERGING-52 - New approaches for Human/AI collaboration for the workforce of the future

Related Development – Privacy preserving compute approach for privacy preserving human – AI system





Relevant Projects

TwinFlow

ARROWHEAD fPVN

- Premise : AI that works collaborates with human may need to be trained with data “about human” to understand, anticipate, perform action according to human preferences – Privacy concerns
- We propose an approach for privacy preservation learning based on multi party computation – no need for raw original data

CALL TOPIC

Our expertise and offering are also for other calls in Cluster 4 where we are interested, such as

- HORIZON-CL4-2027-04-DATA-03: New approaches for decentralized, federated and sustainable AI data processing
- HORIZON-CL4-2027-05-DIGITAL-EMERGING-02: AI-Driven Manufacturing Line Design and Optimization
- HORIZON-CL4-2027-04-DIGITAL-EMERGING-05: Apply AI: AI-Driven Robotics for Industry: Enabling System Integration and Adoption (Partnership in AI, Data and Robotics)
- HORIZON-CL4-2026-01-DIGITAL-EMERGING-51-two-stage: AI improved advanced manufacturing and production processes in factories (RIA) (Made in Europe and ADRA partnerships)
- HORIZON-CL4-2026-01-DIGITAL-EMERGING-53-two-stage: Innovative AI methods and technologies for the process industries (RIA) (Processes4Planet and ADRA partnerships)
- HORIZON-CL4-2027-04-DIGITAL-EMERGING-04 : Apply AI: Challenge-Driven AI Innovation Booster in Apply AI prioritised sectors
- HORIZON-CL4-2027-01-MAT-PROD-02 : Advanced manufacturing for key products
- HORIZON-CL4-2027-01-MATERIALS-PRODUCTION-03: Factory processes and automation for de- and re-manufacturing (RIA) (Made in Europe partnership)
- HORIZON-CL4-2027-01-MAT-PROD-08 : Textile circularity through advanced processing and manufacturing technologies and system approaches
- HORIZON-CL4-2027-01-MAT-PROD-16 : TECHNOLOGIES FOR INNOVATIVE PROCESSING OF RAW MATERIALS

THANK YOU

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Aalto Factory of the Future - https://www.aalto.fi/en/futurefactory