

EUHubs4Data

Smart worker assistant INCODE Project

Accelerating the Adoption of Manufacturing Use-Cases through Computing Continuum and Data Spaces

Maria Rossetti, MADE Competence Center
27/10, 16:30-17:30, Room 4D



IN COLLABORATION WITH



INCLIVA | VLC
Biomedical Research Institute



UNDER THE AUSPICES OF



Programming Platform for Intelligent Collaborative Deployments over Heterogeneous Edge-IoT Environments [INCODE]

Design and develop an open platform for the deployment and **dynamic management of end-user applications, over distributed, heterogeneous and trusted IoT-Edge node infrastructures**, with enhanced programmability features and tools.



Design and implement a highly scalable infrastructure management layer (IML)



Design and implement an open, extensible programming toolset to facilitate the development, management of highly efficient applications on edge-connected node



Develop a trusted, interoperable, scalable, and secure framework for data distribution and IoT



Deploy a reference cloud-managed testbed integrating open best-of-breed data plane technologies with edge computing capacity wired interconnected IoT system



Develop robust, scalable application, business programmability stratum (ABPS) to manage a large number of geo-distributed instances



INCODE



Consortium

uni.systems



NEC



SIEMENS



agentscape



MADE Competence Center I4.0

MADE Competence Center Industry 4.0 is a public private partnership established in 2019 in Milano with 4 universities, 42 private manufacturing and engineering companies and a public body.

**+ 2500 mq
Testing Facility**

**+ 50 manufacturing
use cases**

+40 partners

AI TEF + EDIH

Industrial Cyber-Security and
Big Data Analytics



Smart monitoring and control
of industrial processes,
Smart energy monitoring and
control, Smart Maintenance



Quality 4.0, product
traceability and additive
manufacturing



Virtual Design and product
development



Digital twin and virtual
commissioning, Lean
production 4.0, Logistics 4.0



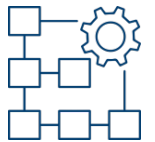
Collaborative robotics and
Smart worker assistance
systems



**AWARENESS
RAISING**



TRAINING
School of Competencies 4.0



**INDUSTRIAL
PROJECTS**



**FUNDED
PROJECTS**

Funded by
the European Union



INCODE



Project use cases

SMART LOGISTICS

- Optimal allocation of human and vehicle resources
- Safe working environment & product mishandling prevention
- Optimal tasks identification based on position and operator needs
- Product quality assurance certifications or warnings



UTILITIES INSPECTION

- Improvement of preventive maintenance activities
- Improvement of failure precautions
- Improvement of safety of assets and personnel
- Improvement of application interoperability



SMART PPDR

- Improved efficiency in PPDR missions
- Minimised human intervention in search & rescue operations
- Optimised resources in critical service delivery








SMART WORKER ASSISTANT

- Optimize workers' position based on production floor operational needs
- Improved labor efficiency due to better informed and directed workers
- Improved efficiency and effectiveness due to increased operator wellbeing







SMART WORKER ASSISTANT Pilot

WHAT IF ...

-  Deployment of multiple IoT nodes serving as sensor gateways with enhanced on board processing
-  Registration of operator status data (biometric, fatigue, cognitive stress)
-  Multiple optimized applications over common IoT-edge
-  Demonstrate real-time actions through collaborative edge-IoT nodes
-  Demonstrate advanced monitoring capabilities

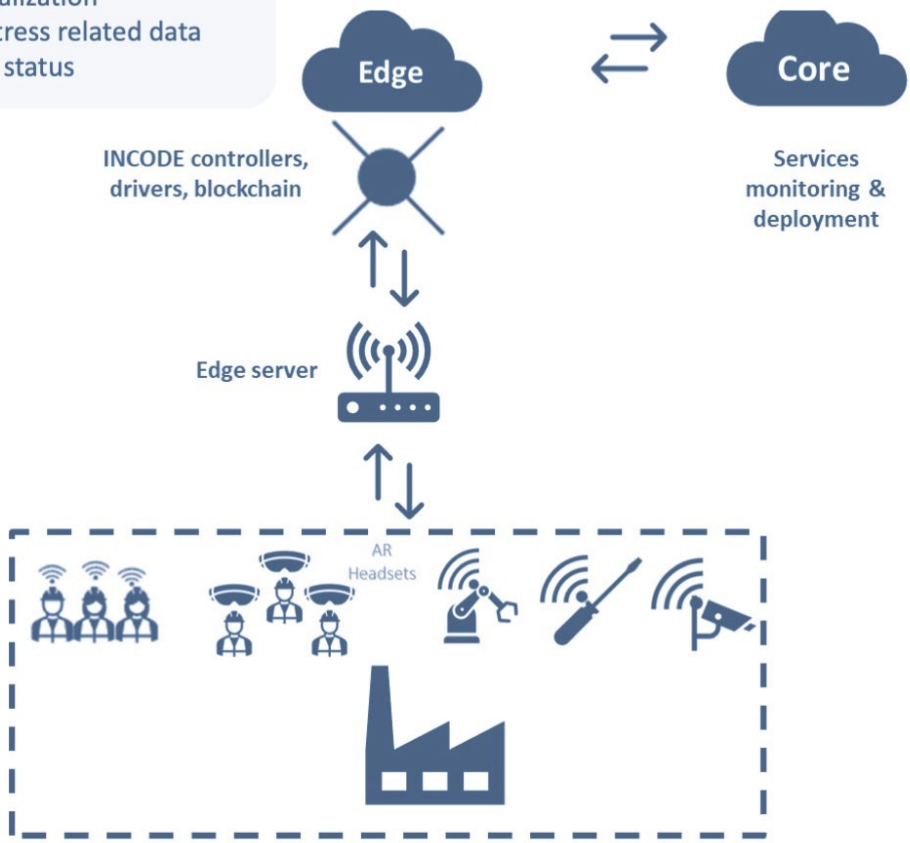


...TO ACHIEVE

-  Introduction of actions triggered by vital signs that can detect and optimized workers' position based on production floor operational needs
-  Safe working environment due to accidents monitored and prevented
-  Improved labor efficiency due to better informed and directed workers
-  Improved efficiency and effectiveness due to increased operator wellbeing

SMART WORKER ASSISTANT Pilot

- Biometric data
- Data visualization
- Fatigue stress related data
- Operator status



HEALTHY OPERATOR

- Human operator performing repetitive task (e.g. material handling)
- Exoskeleton, electromyographic wearable sensors
- The sensors identify a stressful condition for the operator, the cobot is reinstructed
- Ensure a safer handling by the operator and/or send an alert to the operator.



HUMAN IN THE LOOP

- Fatigue, cognitive stress of the operators
- Behavior detected by the informative system, the production system is hence reinstructed to handle this change by slowing down the productions speed of the line...
- ...until the operator's parameters get back to the usual set or until the operator is substituted by the colleague of the next shift.

THANK YOU!!

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