



Cognitive Computing Continuum Cluster



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EMPYREAN: TRUSTWORTHY, COGNITIVE
AND AI-DRIVEN COLLABORATIVE
ASSOCIATIONS OF IOT DEVICES AND EDGE
RESOURCES FOR DATA PROCESSING
COORDINATOR: ICCS/NTUA
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Get to know the research initiatives about Cognitive Computing Continuum

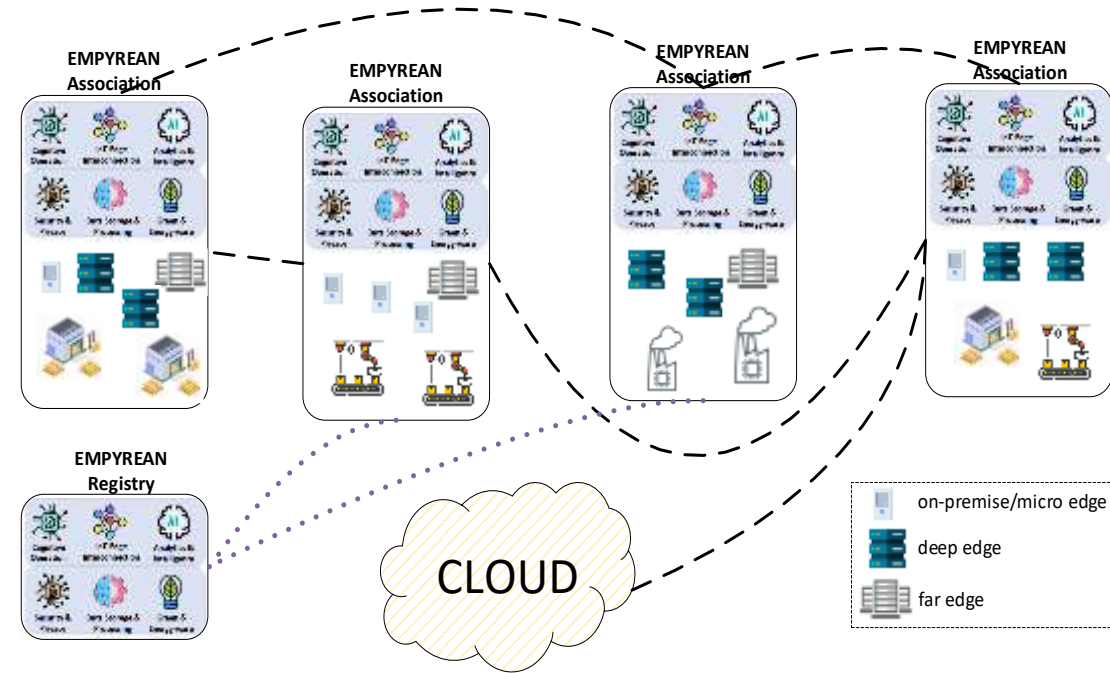
8 October 2024

Project introduction

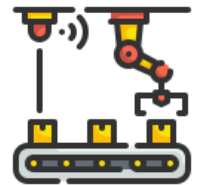


Cognitive Computing
Continuum Cluster

- EMPYREAN envisions a collaborative autonomous computing ecosystem over heterogeneous resources, different providers and connectivity types
- EMPYREAN will build federations of collaborative resources, IoT devices and robots, the Associations
- An Association will provide a secure execution environment
- Association-based continuum will balance computing tasks and data locally inside an Association as well as between federated Associations.



- High-demanding, safety-critical, dynamic, greatly impactful applications that pose heterogeneous demands.
- **Advanced manufacturing UC**
 - Developing a system able to perform process monitoring in robotic machining cells.
 - Demonstrate EMPYREAN platform as a key enabler for the ongoing industrial revolution.
- **Smart agriculture UC**
 - Developing a Soil Organic Carbon (SOC) process to assess the soil state in agriculture fields.
 - Demonstrate a revolutionary way to monitor and manage soil health, leading to more sustainable and efficient agricultural practices.
- **Warehouse automation UC**
 - Developing technologies to operate fleet of robots for order picking functions in warehouses.
 - Demonstrate secure and trusted interconnection of warehouses served by distributed Associations.





- EMPYREAN's Associations will enable European entities, to make their own choices, regarding the processing and storage of data
- EMPYREAN's unique technological advancements and their application in key sectors will contribute towards the realization of Europe's digital and industry related targets
- EMPYREAN is committed to promote software interoperability and portability, realizing an EMPYREAN open ecosystem based on Associations
- EMPYREAN partners will promote the strategic industrial cooperation in AI/ML-based data storage and processing that can benefit the EU industry in the global IoT-edge-cloud service markets



- Development activities in:
 - decentralized security & privacy
 - secure distributed edge storage
 - IoT-edge interconnection
 - efficient data processing of ML-workloads
 - cognitive operation
 - AI-augmented application development & deployment
 - energy-aware orchestration



Thank you

