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TURKEYⁱⁿ
HORIZON 2020
COOPERATION. INNOVATION. COMPETITIVENESS

Technical Assistance for Turkey in Horizon 2020 Phase-II

EuropeAid/139098/IH/SER/TR

Turkey in Horizon 2020 II

‘Cluster 4 – Computing Technologies 2022 Call Topics’

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General and Information Training on Horizon Europe

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REPUBLIC OF TURKEY
MINISTRY OF INDUSTRY
AND TECHNOLOGY



COMPETITIVE
SECTORS
PROGRAMME



TÜBİTAK

Horizon Europe Cluster 4: 2022 Call topics: Computing Technologies

- **Call topics:**

- HORIZON-CL4-2022-DATA-01-02: Cognitive Cloud: AI-enabled computing continuum from Cloud to Edge
- HORIZON-CL4-2022-DATA-01-03: Programming tools for decentralised intelligence and swarms

- **Deadline:** 05 April 2022

- **Overall indicative budget:** 90M€

Note 1: Applicants should use the official call documents (including HE Cluster 4 Workprogramme 2021-22; Admissibility conditions, eligibility conditions, financial & operational capacity and exclusion, award criteria, etc. The current presentation serves informative purposes.

Cognitive Cloud: AI-enabled computing continuum from Cloud to Edge (1/2)

HORIZON-CL4-2022-DATA-01-02

RIA; Available budget: 50M€; 10 projects

Start TRL 2; End TRL 5

Outcome

A new AI-enabled Cloud-edge framework:

- Automatically **adaptable**
- Respond & adapt **intelligently** to changes
- Automatic deployment, mobility and secure adaptability of services from cloud to edge to **diverse users and contexts**
- Resource management: **openness & trustworthiness** of resource management layers
- Interface with all layers in the **computing continuum & learn**
- AI-techniques for dynamic load balancing to **optimize energy efficiency**, balance data traffic
- Adapt **processing capacity** of the cloud to green energy supply
- Empowering application developers with **greater control**; end-users benefit from **seamless access**

Cognitive Cloud (2/2)

Scope

HORIZON-CL4-2022-DATA-01-02

- ✓ Cloud management layer
 - ❖ AI techniques & models
 - ❖ Automatic adaptation to computing resources
 - ❖ Optimise where data are processed
- ✓ Integration of diverse computing & data environments
 - ❖ Seamless, transparent & trustworthy integration
 - ❖ AI-enabled computing continuum
- ✓ **Adaptation** to the growing complexity of requirements and exponential increase of data
 - ❖ Automatic
 - ❖ Optimal use of resources, holistic security & data privacy & credibility
- ✓ Address interoperability challenges (computing & data platform providers) and cloud federation approaches

Indicative projects



Novel framework for the design and operation of AI applications in computing continua

<https://www.ai-sprint-project.eu/>

HORIZON CLOUD gathers European cloud computing stakeholders to increase collaboration

<https://www.h-cloud.eu/>



Novel ecosystem of cloud-based technologies, spanning from specialized hardware resources up to software toolsets.

<https://ict-serrano.eu/>



Programming tools for decentralised intelligence and swarms (1/3)

HORIZON-CL4-2022-DATA-01-03

RIA; Available budget: 40M€; 5-7 projects

Start TRL 2; End TRL 5

Outcome

- Agile & secure architectures for collaborative smart nodes:
 - Decentralised or swarm intelligence
 - Build **European** strength on embedded sensors and devices & wireless communication (non-cellular and mobile 5G networks)
- Programming environments for smart edge-connected nodes and dynamic groups of nodes
 - Across the device-edge-cloud continuum
 - Reduce complexity of programming and maintenance
- Dynamic open environments and tools
 - stimulate open architectures and interfaces
 - Interoperability & avoiding vendor lock-in
- Reinforced **Europe's** position in the market of next generation smart systems (sensors and devices)

Programming tools (2/3)

HORIZON-CL4-2022-DATA-01-03

Scope

- ✓ Develop agile and secure architectures, dynamic programming environments and tools for the compute continuum from the device and edge perspective:
 - ❖ energy-efficient, lightweight AI-based approaches
 - ❖ tools for decentralised device and edge intelligence
 - ❖ innovative mesh architectures with mixed topologies
 - ❖ In support of tactile internet and swarm intelligence
- ✓ Paradigm shift from programming environments for individual devices to dynamic groups of devices like swarms
- ✓ Include:
 - ❖ actionable data streams, contextual interaction and data fusion between the users and the objects
 - ❖ analytical model distribution, delocalized computation and new mesh architectures

Programming tools(3/3)

HORIZON-CL4-2022-DATA-01-03

Scope (continued 1)

✓ Combine:

- ❖ Advances in smart sensor networks, new generations of embedded processors, and operating systems for the edge with
 - ❖ seamless federation of object identities (IDs) and distributed operation of heterogeneous IoT devices and smart systems to achieve **higher resilience**, **security** and **trust** in embedded AI applications
- ✓ Validate the concepts in **at least 3 application areas**
- ❖ Automated driving, health, farming, smart factories, utilities, cities and communities, logistics, buildings
- ✓ Contribute to the sustainable use of energy
- ❖ optimising energy efficiency
 - ❖ promoting the use of renewable energy

Indicative projects to get ideas

REScala - ERC-2019-POC - ERC Proof of Concept Grant

A Programming Platform for
Reactive Data-intensive
Applications

[https://cordis.europa.eu/project/
id/862535](https://cordis.europa.eu/project/id/862535)

Bros (H2020-MSCA-IF-2016)

Blockchain: a new framework
for swarm RObotic Systems

[https://cordis.europa.eu/proj
ect/id/751615](https://cordis.europa.eu/project/id/751615)

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