Newsletter

Volume 1, Issue 1
March 2023

EdgeAI at a glance

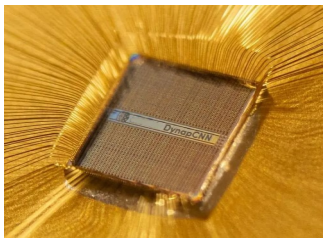
Key Digital Technologies Joint Undertaking (KDT JU) EdgeAI consortium consists of 49 partners, from 11 countries, mobilising Europe's best capabilities from industry, research, and academia across edge AI, semiconductors, microelectronics, embedded systems, AI software development and OEMs.

All partners have a strong R&D footprint in Europe, which enables a sustainable collaboration according to the European strategy, values, and priorities.

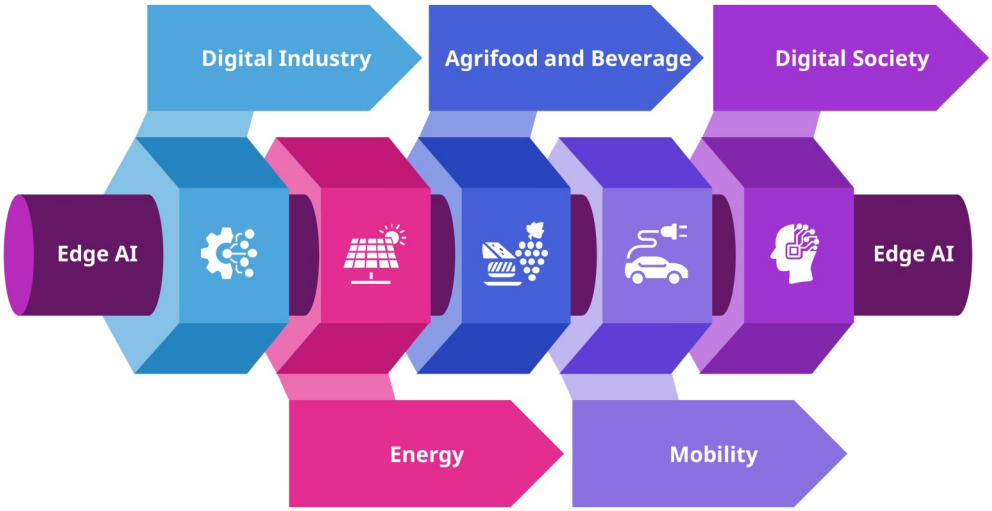
EdgeAI consortium gathers all the necessary background and critical mass to lay the foundations to realize edge AI and acts as a lighthouse for putting Europe at the forefront of this area.

EdgeAI is a key initiative for the European digital transition towards intelligent processing solutions at the edge.

EdgeAI develops new electronic components and systems, processing architectures, connectivity, software, algorithms, and middleware through the combination of microelectronics, AI, embedded systems, and edge computing. It will demonstrate the applicability of the developed edge AI hardware software algorithms approaches across various vertical solutions, considering security, trust, and energy efficiency demands inherent in several use cases. The project covers key strategic application areas such as Digital Industry, Energy, Agri-food and Beverage, Mobility, and Digital Society.



DYNAP Neuromorphic Chp
Source: SynSense



Key Facts

Start: 01 December 2022

Duration: 37 months

Budget: 35,43 M€

Coordinator: SINTEF AS

Consortium: 49 partners

Countries: 11

Collaborative Initiative

EdgeAI promotes a collaborative concept where stakeholders across key domains (HW/SW electronic components, systems, applications, and AI) work together.

EdgeAI developments implement applications across the edge continuum (micro-, deep-, meta-edge).

The goal is to deploy functionality defined by processing requirements, latency, reliability, energy efficiency and performance.

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KDT JU EdgeAI project - The kick-off meeting

EdgeAI project kick-off meeting was held in Catania, Italy on 21-23 February 2023, gathering around 70 participants to discuss the priorities in edge AI technologies and the activities to develop these new technologies over the next years.

EdgeAI is a flagship project for AI technology development at the edge that aims to apply the technologies in 20 demonstrators across 5 industrial value chains: digital industry, energy, agri-food and beverage, mobility, and digital society.

The EdgeAI project include the major European semiconductor manufacturers that bring the latest technology developments in edge AI toolchains, new micro-controller architectures and AI-based hardware platforms.

The project addresses the layers of a full-edge AI technology stack and application: sensors, hardware (e.g., micro-controllers or processing units), SW/HW interfaces, AI frameworks, algorithms, neural network architectures/topologies and new learning data types and methods. EdgeAI project partners develop technologies that enable the powering of scalable, mission-critical, and industrial edge AI applications.

EdgeAI project aims to positively influence the European Union's climate-neutral ambitions by having a significant impact on the Green Deal in two directions: one is by increasing energy efficiency and lowering the power consumption of the electronic components, algorithms, and AI methods at the edge and the other is by increasing the processing capabilities and reducing the overall energy consumption and CO_2 footprint of the applications using edge AI components.

The project aims to substantially impact the European Chips Act as the technology developments will identify several challenges that can be put forward as new topics for growth within the next Chips JU European partnership calls.

For three days, the EdgeAI partners presented and discussed the edge AI technological developments and the activities to ensure the adequate planning, implementation and follow-up of the project, including efficient collaboration between partners, virtual/physical meetings, preparation of communication materials, networking events, working sessions to exchange practices and develop results in the demonstrators to be implemented.

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The EdgeAI plans to implement activities around the edge AI academy concept by publishing and promoting the project results through the organisation of conferences, sessions, and events aimed at sharing, explaining, and promoting the edge AI technologies and applications developed by the project partners.

Dr Ovidiu Vermesan, Chief Scientist at SINTEF Digital and the coordinator of the EdgeAI project stated during the kick-off meeting: *"One of the most significant challenges for edge AI technology developments is improving the energy efficiency and scalability of processing performance, given the different resource constraints for devices, algorithms, and platforms at the edge. Edge AI applications feature enormous heterogeneity in their combined technologies and algorithms, which presents difficulty when solutions must be optimised in different sectors and benchmarked against one another. Heterogenous processing is key to this as the project seeks to advance neuromorphic architectures and combine different hardware architectures to provide optimal AI processing.*

EdgeAI addresses processing at the edge as a granular continuum encompassing the micro-edge (processing capabilities which are very close to the sensors, microcontrollers, etc.), the deep edge (processing units with extended processing power, such as mobile phones, gateways, etc.) and the meta-edge (micro-servers combining processing units and different microcontrollers for specific operations, for instance). These developments will be partly based on trends observed over the past years that relate to distributed autonomic systems, which employ edge AI techniques to enhance autonomous behaviour in different implementations or collaborative systems.

Edge AI technologies enable more intelligent functionality and can create cross-functional, scalable autonomous systems that have what I call "intrinsic intelligence" and "extrinsic intelligence". Intrinsic intelligence is the intelligence built within intelligent edge devices, robotic things, or autonomous vehicles, while extrinsic intelligence is the intelligence used for collaboration between these entities in different applications across the industrial sectors."

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Goals

To create a new framework embedding intelligence at the edge, and strengthening the development of low-power, real-time, energy-efficient AI hardware, embedded AI and software addressing multiple computing paradigms across the edge continuum.

To increase energy efficiency, improve processing capability, increase trustworthiness, and reduce the CO2 footprint of embedded edge AI applications across multiple industrial sectors.

To foster a dynamic edge AI European ecosystem based on the AI technology stack and digital value-chains across industrial sectors and increased competence and skills, leading to new industrial applications and new market opportunities for Europe.

To advance research and innovation in edge AI-based technologies, new processor architectures, electronic components and systems, tools, AI-design methods, and middleware that guarantee security, trust and energy efficiency for infrastructures and industrial sectors across Europe.

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or KDT JU. Neither the European Union nor the granting authority can be held responsible for them.

Consortium

SINTEF, Infineon, ams OSRAM, SoftwareCUBE, TU/e, imec, NXP, GNT, NEURO Controls, COGNITION FACTORY, IMST, Universität zu Lübeck, netcompany intrasoft, life.augmented, VRANKEN POMMERY, TECHNEXT, cea, GRENOBLE INP UGA, Université de Reims Champagne-Ardenne, cnrs, Université Polytechnique Hauts-de-France, Χαροκοπειο Πανεπιστημιο Harokopio University, scm group, HTS High Technology Systems, Intelligent Machines IoT & Cyber Physical Systems DeepSensing S.R.L., Xtremion, Università degli Studi di Cagliari, Alma Mater Studiorum Università di Bologna, Università degli Studi di Milano, Elektronikas un datorzinātņu institūts Institute of Electronics and Computer Science, signify, Technolution, almende, TU/e, Fredrikstad energi, NxtEnergy, PROLUX, nxtech, ITML, CONVERGENCE

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