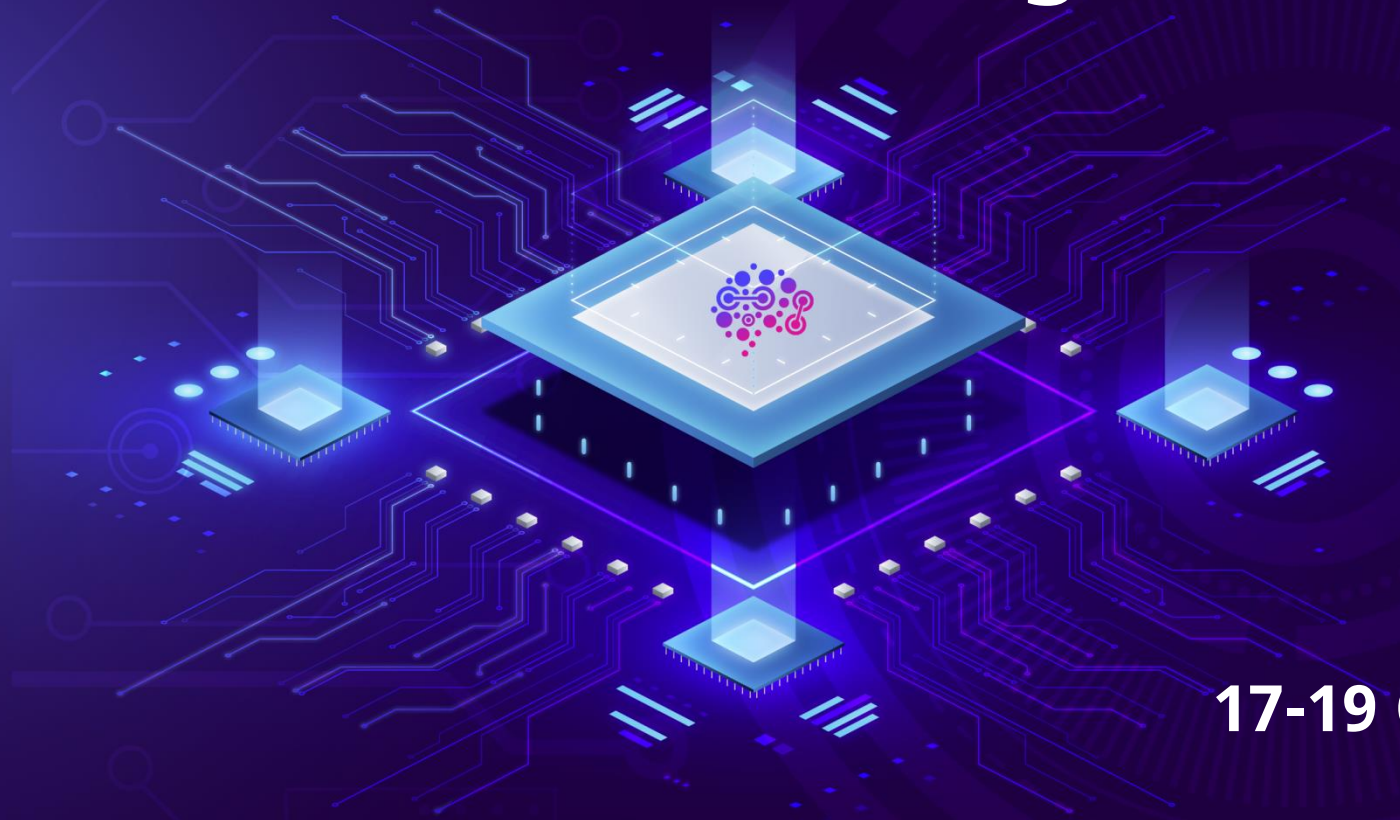
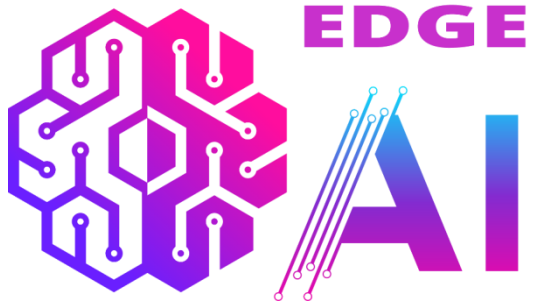
European Conference on EDGE AI Technologies and Applications - EEAI



Advancing emerging edge AI technologies and driving next generation intelligent applications.

17-19 October 2023, Athens, Greece

European Conference on EDGE AI Technologies and Applications - EEAI



NEUROKIT2E

Fabian Chersi, CEA, France

17-19 October 2023 Athens, Greece

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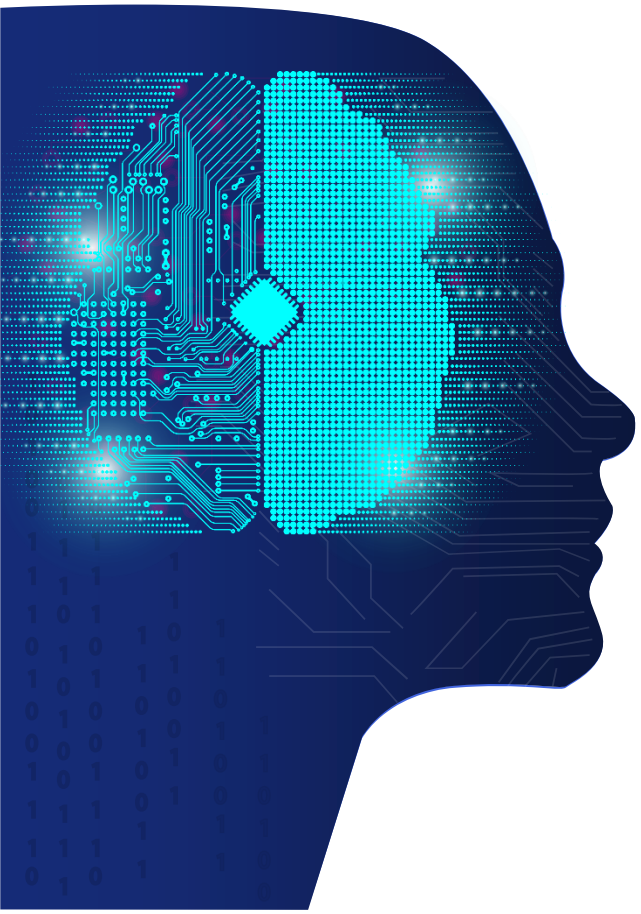
Presentation Outline



- Overview
- State-of-the-art
- Highlights

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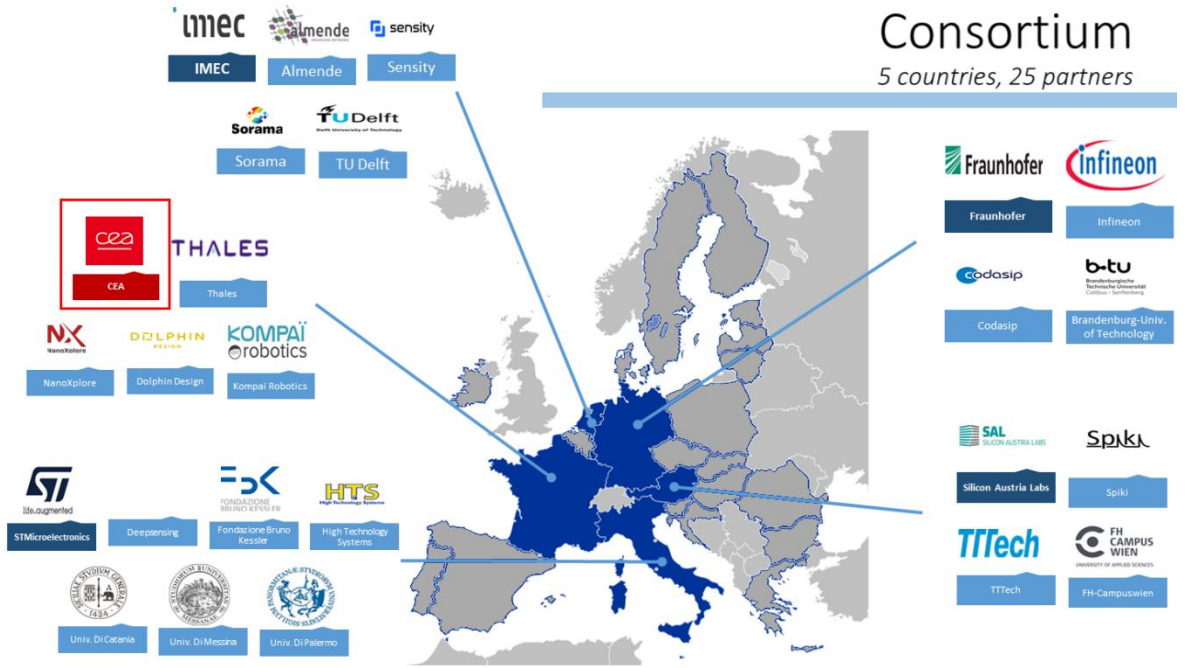
Project Overview

The aim of this project is to develop a software called AIDGE that will:

1) Position Europe on the market of embedded AI, with solutions that are sovereign and independent
2) Answer the need for architectures that are real-time, confidential, secure, and low power
3) Favor Europe in a high value sector, leading to important economic benefits and creation of jobs.
4) Provide the industry with easy and powerful tools to deploy at large scale AI algorithms in demanding and constraint environments



7 use cases in 5 domains

Transports | **Industry 4.0** | **Energy** | **Healthcare** | **Digital Society**

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State-of-the-art Developments in the Project

- Embedded AI as objective
  - Neurokit2E builds upon a N2D2 (TRL 6), a proven solid base for projects like and ANDANTE and DEEPGEEN
  - Current frameworks are not principally aimed at embedded AI (possibly only as derivations or by-products)
- An integrated development process
  - Neurokit2E/AIDGE integrates hardware models into the NN model in order to deliver a targeted optimization
  - Neurokit2E/AIDGE provides an end-to-end development chain, from networks to deployment
- Advanced compression methods to reduce model sizes
  - Quantization, Pruning, Sparsification are done hardware aware
  - Different methods can be mixed to maximize compression while maintaining performance
- Deep Neural Networks + neuromorphic architectures
  - AIDGE is the only industrial level framework that allows to integrate in the same network traditional (tensors) with event-based (spiking) neurons.

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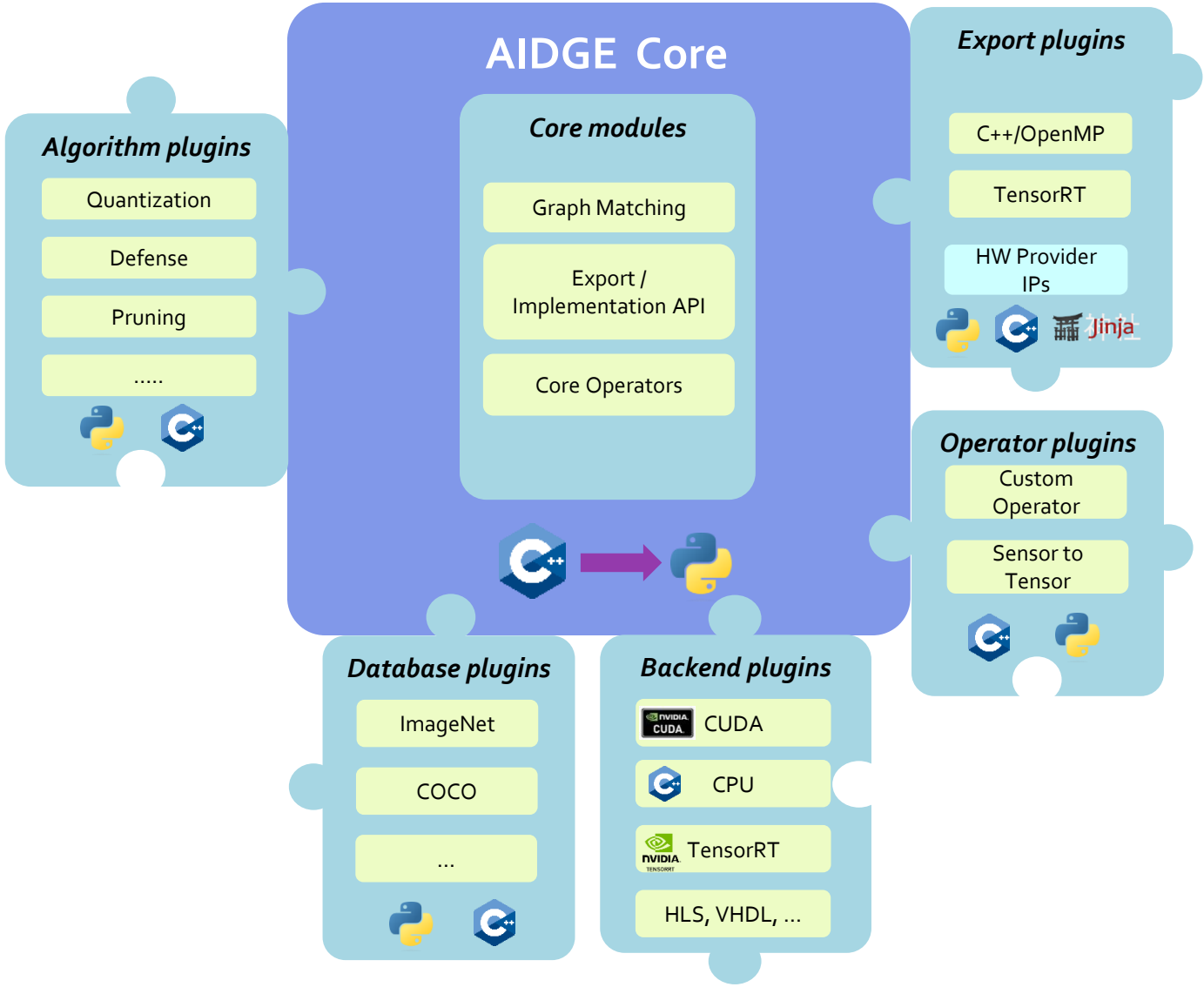
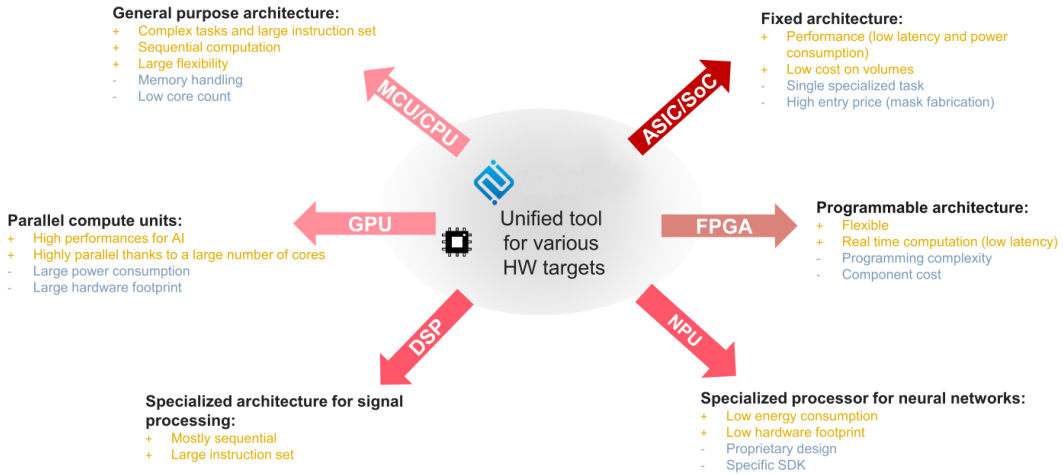
Project Highlights

AIDGE will allow to:

- Automatically, easily and rapidly generate stand-alone code for a variety of targets
- Test and compare performances across different devices and configurations
- Rapid prototyping and exploitation



Embedded HW code generation



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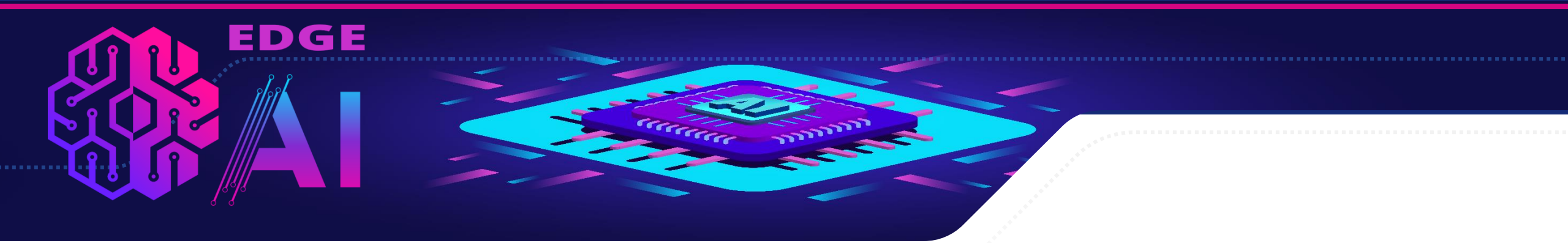

Thank You

For your attention

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