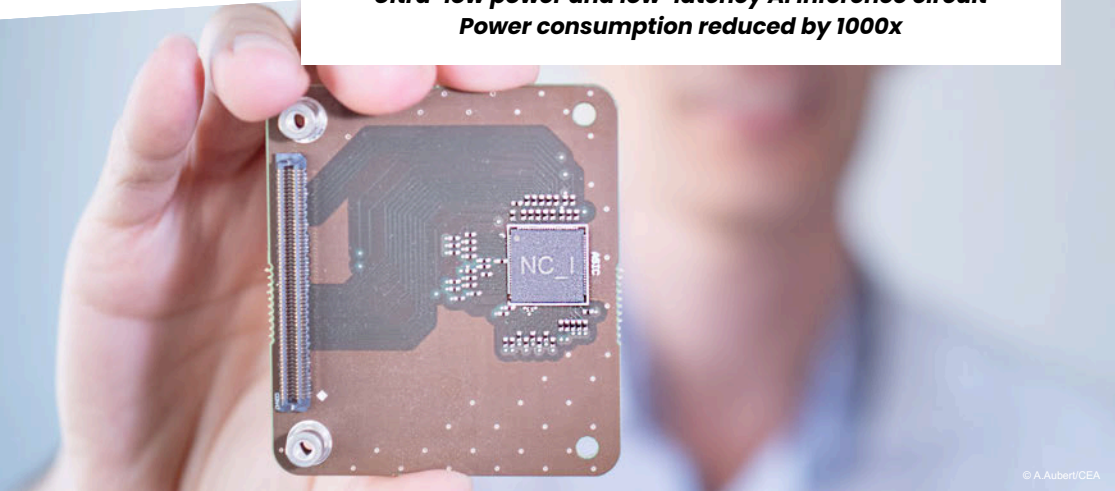


Ultra-low power and low-latency AI inference circuit Power consumption reduced by 1000x



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What is NeuroCorgi ?

NeuroCorgi is an application specific circuit (ASIC) dedicated to AI inference. Compared to commercial circuits, it has 1000x lower power consumption while processing HD images at 30FPS with a latency lower than 10 ms.

It is based on a disruptive approach consisting in:

- Streaming architecture computing layer-by-layer with a dedicated processor for each layer, achieving low latency.
- Fixing a large part of the neural network topology and its parameters inside the chip in order to avoid external memory operations, thus, eliminating the most energy consuming data movements.
- A set of tools to generate a complete new custom circuit configuration for a given AI model (from a new training dataset to ASIC design in one month time frame)

It is possible to fully exploit a single circuit configuration on multiple applications thanks to a transfer learning compatible design allowing easy integration of custom lightweight AI model head for each new application.

NeuroCorgi Circuit

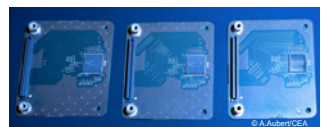
• Power consumption under 100 milliwatts

• HD image recognition applications at 30 frames per second

• Less than 10 milliseconds latency

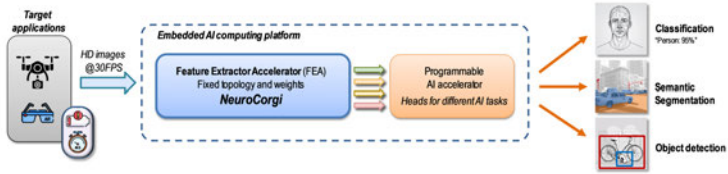
Different NeuroCorgi variants:

- Classification/segmentation
- Object detection
- Non volatile memory



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Innovation & Assets



This disruptive approach of NeuroCorgi allowed to design a circuit with exceptional performance

- Integration of a MobileNet v1 with 3.18 millions of parameters in less than 10 mm²
- Power consumption under 100mW, 1000 times lower than conventional solutions
- The latency per high definition image is less than 10ms

This breakthrough has been obtained thanks to

- The use of Aidge framework for model optimization based on Quantization Aware Training
- Automatic RTL code generation to describe the circuit architecture (CorgiBuilder)
- Some manual fine-tunings (parallelism, multi clock)

Tools & Methodology

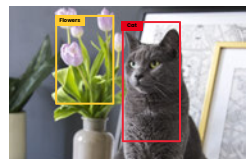
- Complete set of tools available for training and generating NeuroCorgi

- Aidge framework (formerly N2D2) for Model Optimization

- CorgiBuilder tool to generate RTL, C++ and SDK models

Applications

Build in 22nm FDX, NeuroCorgi has been tested on diverse applications from object detection, classification, segmentation on both images and audio data. It has been experimented on different types of use cases: intrusion detection, sound classification in submarine drones, radio spectrum analysis, multispectral cameras... NeuroCorgi is relevant for any markets where low power AI inference at the edge is key: Defense, Security, Mobility...



Our offer

- Dedicated ASIC design know-how
- Tools to assist the development of custom, high efficient and low cost hardware accelerator
- Expertise in Embedded AI for optimal software hardware codesign

For more information about our offer :

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