HAWAI.tech

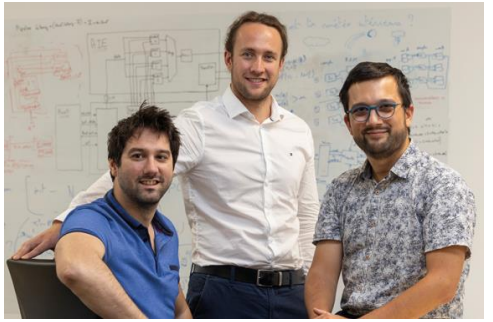
Investors deck
05.2024

Raphael Frisch, CEO

Trusted AI for embedded systems

Who are we?

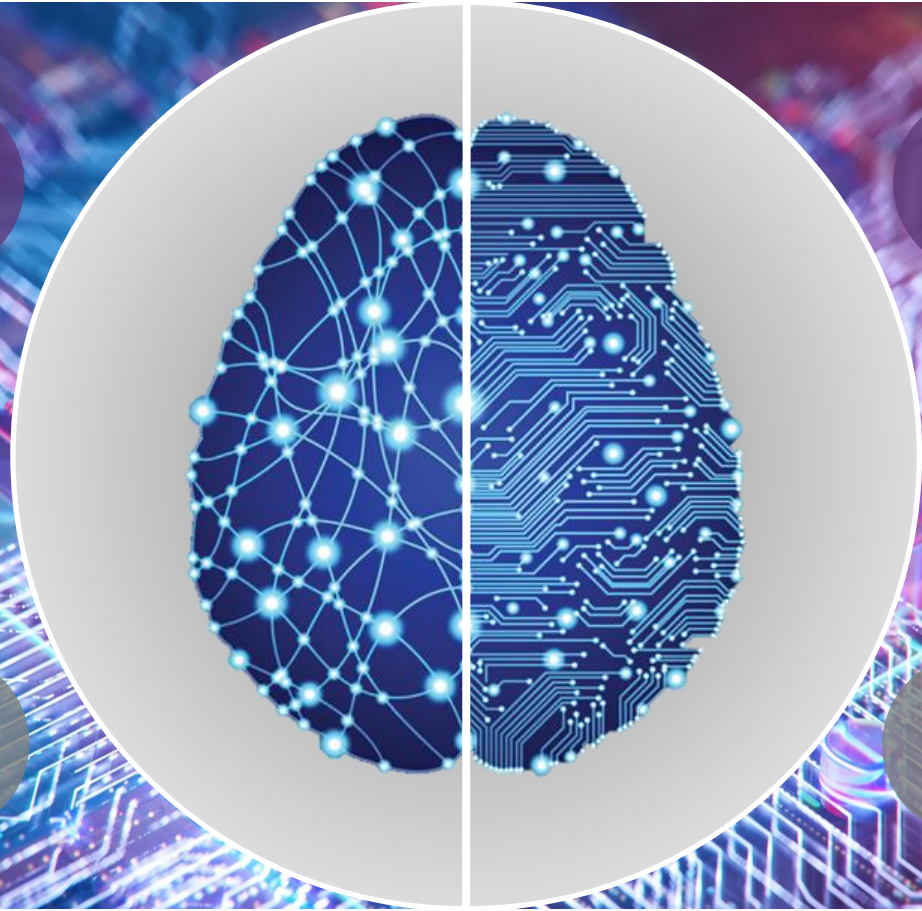
- Based in **Grenoble**, France
- Incorporation : Feb **2019**
- Spin-off from CNRS and Inria
  - Two major research centers in France
- Team of 12 people lead by a trio
- **Expertises** :
  - probabilistic AI
  - hardware design



The best of both worlds for efficient embedded systems

Probabilistic AI

Hardware (IP)



Frugal

Efficient

Explainable

Embedded

Autonomous industrial AI needs new HW/SW paradigm

Ability to handle uncertainty

high

low

Deep learning dedicated hardware

Edge AI in critical systems

Mission Planning | Risk analysis | Pred. maintenance

dedicated hardware

The next AI frontier

Deep learning

neural networks, reinforcement learning, neuro-symbolic AI, ...

Probabilistic AI

Bayesian, active inference, ...

Machine learning

kernel-based, regression, clustering, ...

Expert systems

Lot of training data
High training costs
Low explainability

Low training data
Low training costs
High explainability

No training data
High explainability

The leadership team

CEO & co-founder

Raphael FRISCH

10 years exp.
- BizDev / AI embedded systems
- Int. M.Sc. in CS at Karlsruhe Institute of Tech. and Ensimag
- PhD Applied maths - Univ. Grenoble Alpes

COO & co-founder

Marvin FAIX

10 years exp.
- Project Management (> 5M€)
- Computing systems for AI
- M. Sc. Phelma – Grenoble INP
- PhD Applied maths – CNRS

CTO & co-founder

Jean SIMATIC

10 years exp.
- EDA and H/W design
- Project management R&D
- Scrum expert
- M. Sc. Ecole Polytechnique
- PhD Semiconductors TIMA/CNRS

VP Sales

Christian VERBRUGGE

25 years in Industry (robotics)
5 years in startups (semicon)
- Experienced sales profile
- Engineering background
- Various management positions incl. in GML sold to Snap Inc.

TEAM 15 people

100+ years team experience

in delivering worldwide leading technologies for probabilistic AI

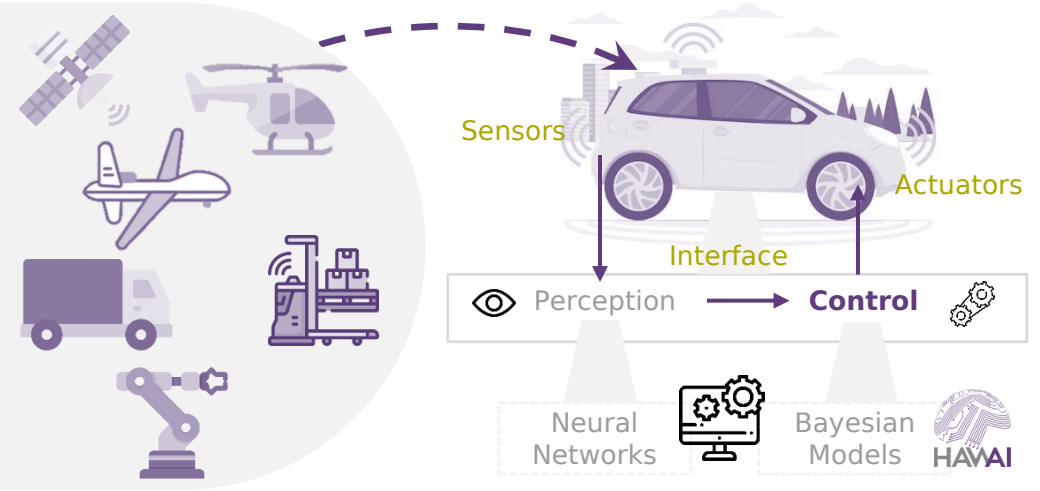
10 PhDs experts 2 patents
- Bayesian modelling
- Compiling and software simulation
- Hardware design

Over 20 publications

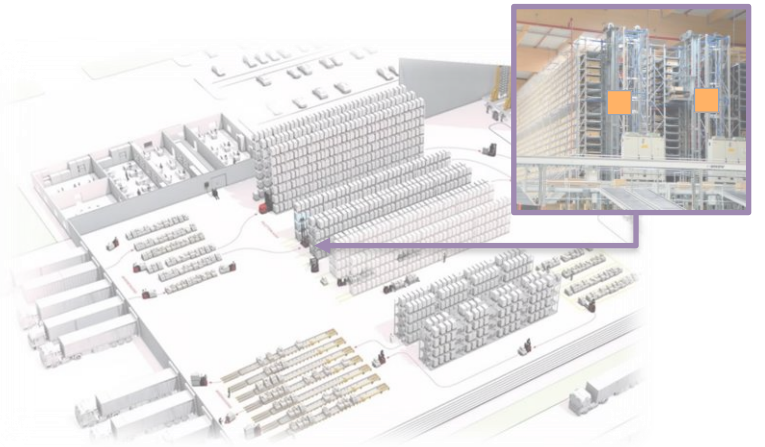
incl. in *Nature electronics*

Applied to decision making in embedded systems

Decision making & mission planning



Maintenance & monitoring



SAFRAN

- Onboard mission planning
- **Projects with Safran and others defense entities**
- Real time embedded computing
- No learning approach

SAVOYE

- Predictive maintenance in logistic centers
- **France2030 project**
- Continuous local monitoring
- Integrate expert knowledge

Market sizing

Flying

TAM : 2.5 B€

SAM : 743 M€

SOM : 2.2 M€

Road

TAM : 4.5 B€

SAM : 1.5 B€

SOM : 8.1 M€

Robots

TAM : 458 M€

SAM : 74 M€

SOM : 4.6 M€

Our latest demo: mission planning in uncertain environment

Problem

- Robot transports pallets in a warehouse, a dynamic and evolving environment
- Needs HW acceleration to **increase performance** and **autonomy**

HAWAI.tech solution

- **AI system** based on **probabilistic AI** (SSP, POMDP)
- **AI accelerator** at the **edge,** powerful and energy efficient
- A **custom-made solution** developed to respond to complex use-cases in uncertain environments

Competitive advantages

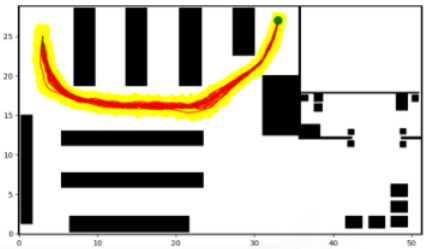
- **Real-time**: Continuous update
- **Uncertainty handling :** Adapt its behavior under constraints
- Hardware **more efficient** than classical GPU:

x6.4 more explorations vs. Nvidia Jetson Orin

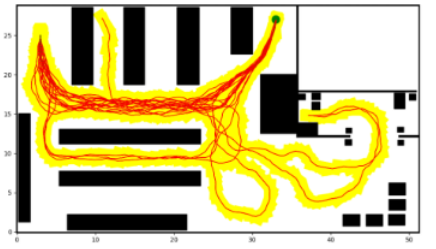
HAWAI.tech HARDWARE FOR AI

Full video at hawai.tech/demo

HawAI.tech



Nvidia Jetson Orin



Our offer: a full stack for rapid deployment

1. FPGA IP

Release Q2 2024

- **Flexible** FPGA architecture based-on Xilinx Versal cards (ACAP)
- **X6.4** energy efficient vs NVidia GPU (see demo)

One shot (NRR) $$
One per asset

+

2. Software suite

- Plug to standard languages with **probabilistic libraries** incl. sample apps
- Specific **Compilation** to optimize edge inference and learning
- **Guidance tools** for designing and analyzing Probabilistic models

Recurrent revenue $$
One per sets of asset

How do customers use our products?

PRODUCTS

1. **BUILD** SPECIFIC HARDWARE COMPUTATION PLATFORM

Compilation tool

provides design help for the specific chip

2. **DEPLOY** THE COMPUTATION PLATFORM

FPGA chip

enables fast execution

3. **USE** PROBABLISTIC AI & ACCELERATION PLATFORM

Guidance tool

probabilistic AI through computation platform

User

- Expert user: **describes data and model** and lets the tool configure the corresponding hardware platform
- Only **focuses on their problem**, their data, their model

- Client owns its computing devices dedicated to its problem
- **Deployment at the edge** of these devices at the client site: vehicles, logistics, robotics, equipment, small computing centers…

- Expert user: configures a **meaningfull set of information to retrieve** from the model
- Regular users: receive alert, consult dashboard and take action

Client’s projects steps

P2’ – Model upgrade

P2 - Volume production

€€€

Delay : 12-36 months

P1 - Qualification + Pre-Industrialization

€€

Delay : 6-12 months

P0 - Evaluation package

FPGA board **€**
+ Model
+ SW dev

Duration: 3-6 months

Lead

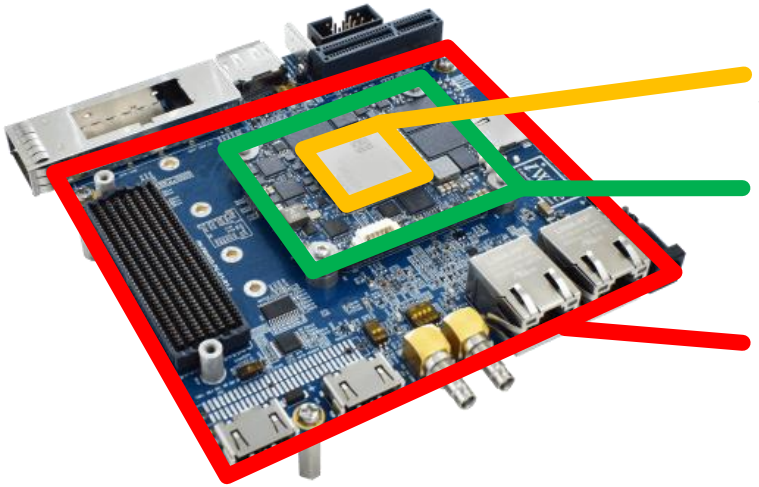
Pricing of HawAI.tech solution

HawAI.tech IP — 450€

Xilinx Versal VE2302 — 850€

System-On-Module (SOM)

SOM Eval Kit (providing I/O)



Total price for **HawAI.tech solution: 1300€**

more than **20% cheaper than Nvidia Jetson Orin** AGX 64GB SOM (1650€)

while being **more than x6 times more efficient** (see demo)

Competitive positioning: data center performance at the edge

TYPE	COMPETITORS	Explainability	Frugal training data set	Real-time capacity	Volume production	Reach & partners
IoT AI H/W	Greenwaves, Grai Matter Labs, Innaterra, Recogni, Syntiant, STM32, Renesas	×	×	≈	≈	≈
Embedded AI H/W	Vsora, Sima.AI, Kalray, Cornami, Hailo, Blaize, Ambarella, Nvidia Jetson	×	×	✓	≈	≈
HPC inference AI H/W	Neureality, Inferentia, UntetherAI, Esperanto, Nvidia A2	×	×	≈	≈	≈
HPC learning H/W (using probabilistic AI)	Google TPU, Nvidia A100, Normal, Ludwig	≈	≈	≈	✓	✓
Specific S/W	Covariant, AMP Robotics, Locus Robotics	×	×	✓	≈	×
Hardware & Software	HAWAI.tech	✓	✓	✓	×	×

A fast paced take-off

Inception

Q1 2019

CNRS + INRIA
15 years
academic research
~60 Person-Years

Pre-seed
350 k€
07.2019

2020

Framework contract with EDF energy utility

(ongoing)

2021

BPI
BFTE

BPI
ADD

2022

2 industrial partnerships

2023

1st Patent
100% HawAI.tech

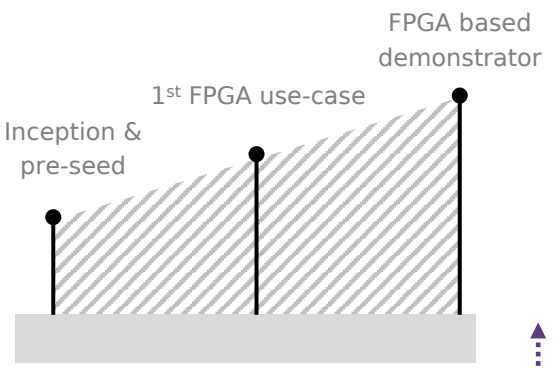
2024

PoC starting in 06.2024
French defense industry leader

Funding round

- **2.5M€ in equity**
- Grants and BPI AR already secured

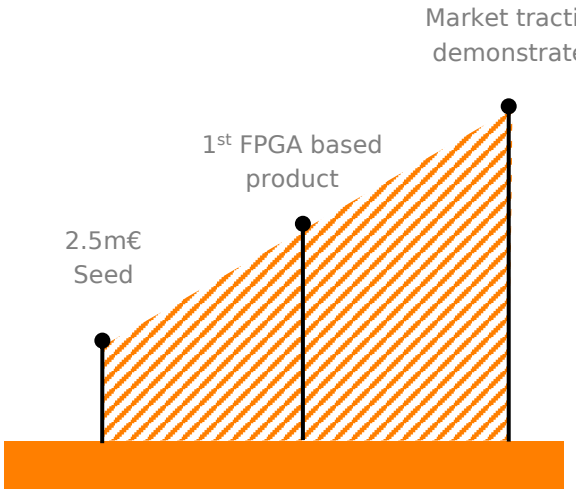
Roadmap



2019 — 2023

Science → Technology

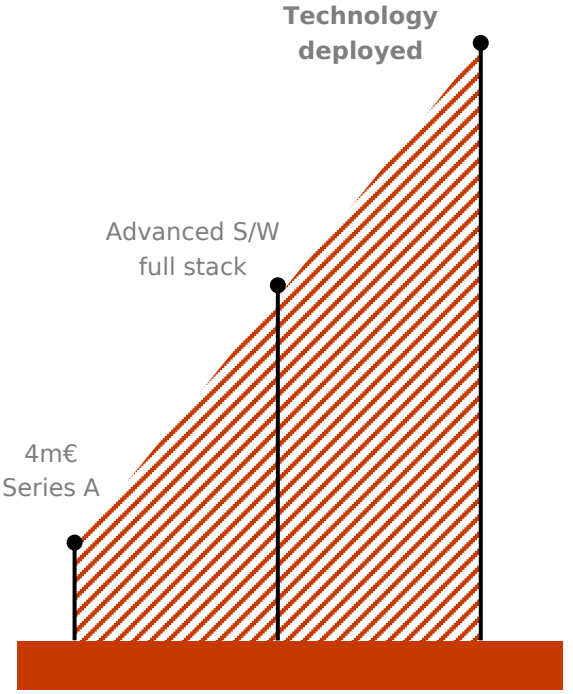
TODAY



2024 — 2025

Industry qualification

User Need → Product-Market Fit



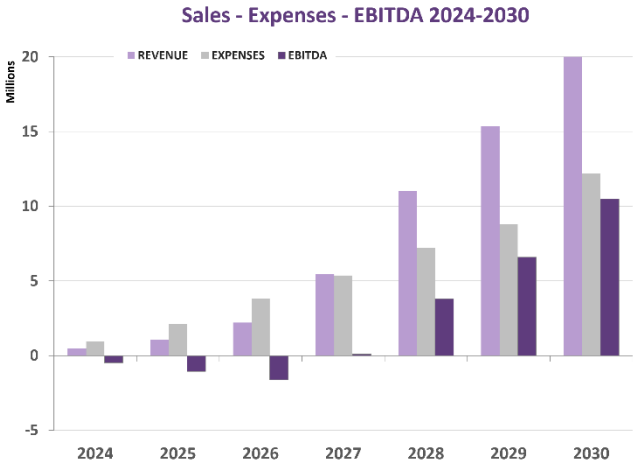
2026 — 202X

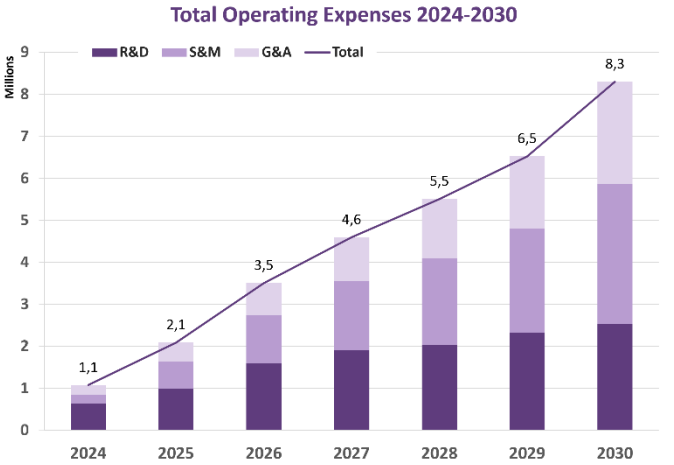
FPGA Massive Industrialization

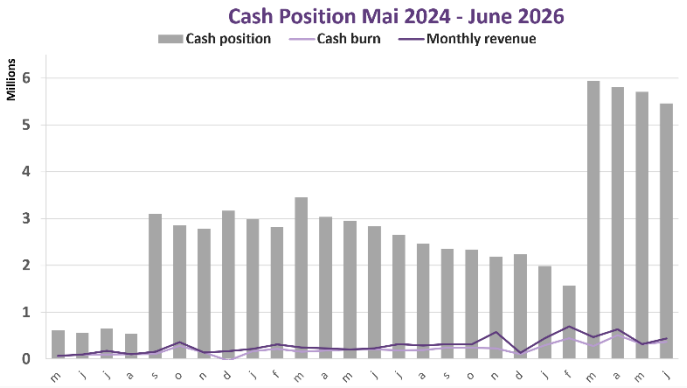
FPGA based market acceleration

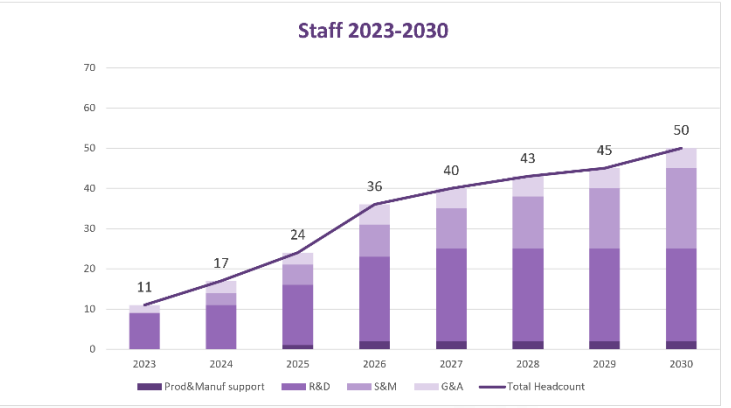
* FPGA: w/ MCMCE IP + custom accelerators

Financial forecast – Quadrigraph









Investment thesis: 2,5M€ fundraising

Financing need (Q3 2024 – Q1 2026)

• **Capital increase**	**2,5 M€**	
• Debt & cash advances	0,8 M€	(already secured)
• Grants	0,7 M€	(already secured)
Total	**4,0 M€**	

Investment considerations

- Fast-growing global market for explainable AI
- Proven traction – ind. leaders as customers/partners
- A clear technology leadership
- Expensive & complex market to entry

Already secured innovation programs :

On period 2022-2027

- Grants 2,7 M€
- Debt 1,1 M€

Use of proceeds

		Hirings
• **HR**	**2,0 M€**	18
• R&D	1,3 M€	10
• S&M	0,6 M€	5
• G&A	0,1 M€	2
• Production	0,1 M€	1
• **External charges**	**1,0 M€**	
• **IP**	**0,2 M€**	
• **Capex**	**0,1 M€**	

CapTable

Founders/Management	90 %
Probayes (Groupe La Poste)	10 %

HawAI.tech in the media

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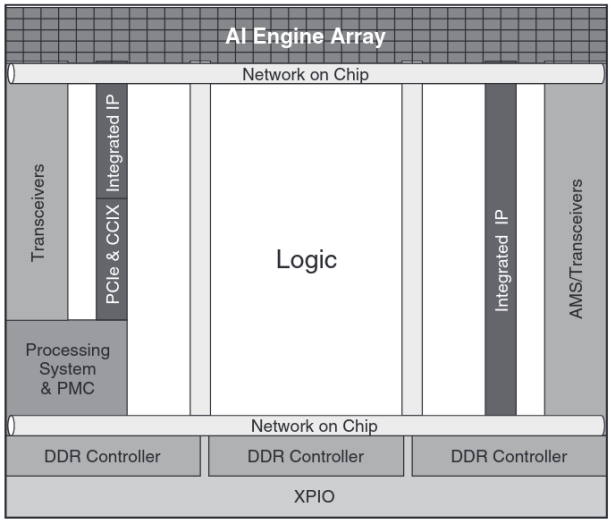
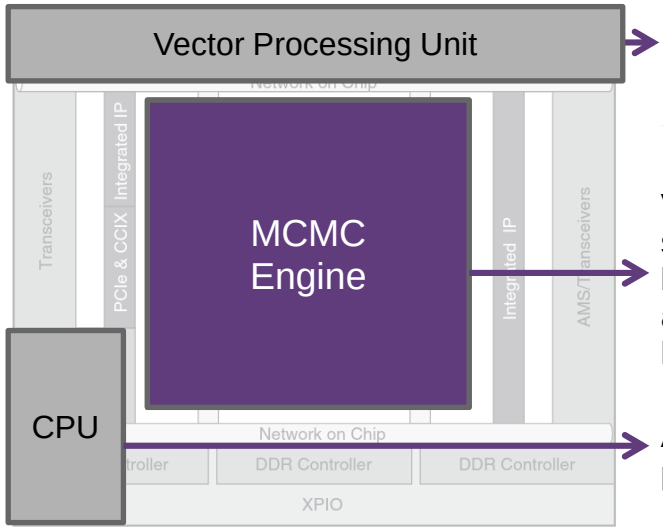
Sampling dedicated architecture

Xilinx Versal ACAP



Proprietary architecture

Inference machine



Classical multiprocessor architecture with DSP/DL capabilities as well as Audio/Video codecs.

Very efficient sampling from simple to complex distributions by integrating custom accelerators and mem hierarchy.

Application processor with platform management drivers

Sampling efficiency

- 1-D Gaussian: 1 Gsample / s (x55)
- 32-D Gaussian: 4 Msample / s (x200)
- Non-parametric sampling (e.g. particle filters): x5000 efficiency vs MCU (Belot 2022, Nature electronics 2023)

System level advantage

- Bayesian matrix factorization:
  On FPGA: 100 Ksamples/s/W (x4.8)
  On ACAP: 210 Ksamples/s/W (x10)
- Benchmark on POMDP solving: x6.4 vs Nvidia Jetson
  See full video at hawai.tech/demo

Except indicated otherwise, benchmarks are run on a Xilinx VCK500 @ 500MHz and compared to an Nvidia RTX 2080

Annex

Recommandation letter from Savoye

SAVOYE
SUPPLY CHAIN SOLUTIONS

HAWAI.tech

SAVOYE

OBJECT: Recommendation letter for our partner HawAI.tech

Dijon, 16 November 2022

To whom it may concern:

We are pleased to provide a recommendation for HawAI.tech and detail on promising joint work with the understanding that the information will be kept confidential.

Savoye (URL) is a mid-sized company of about 1,000 collaborators (headquartered in Dijon, France) and European leader in the design and integration of robotics systems for logistics centers and software to optimize supply chain operations. The company designs and maintains turnkey solutions tailored to the specific needs of each client and relies on a client base of 1,000 centers equipped globally. The company is growing at an average pace of c.a. 20% year-on-year, carried by its international expansion – most notably in North America. To sustain its growth further in the future, the company is investing significantly in advanced R&D projects and cutting-edge technology incubation capabilities.

Amongst our strategic lines is to differentiate our solutions with intelligent control and superior performances, notably by using machine learning to anticipate future states of our complex systems. Our Advanced R&D and Innovation team has notably developed and industrialized a software brick able to anticipate future demand in logistics centers. We are also ambitioning to develop of our service offering and associated revenue with data-centric and predictive maintenance capabilities.

Purely data-driven approaches to predictive maintenance by AI are wasteful though, both energetically and given the computing resources they require. The ROI with such an approach is also severely hampered by the cost of the underlying infrastructure to host and perform operations on the data. A cleverer approach would be to combine a data-driven approach with rule-based, expert models built upon the knowledge of the craftsmen.

The probabilistic AI accelerators of HawAI.tech offer the prospect of exploiting this synergy, in a distributed architecture allowing data to be processed at the edge, and to run larger models only when required. Not only does this appear to be the most cost-efficient way of deploying

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SAVOYE

predictive maintenance services in automated warehouses, but it also paves the way for an explainable predictive model that would allow our service team to explain to the client why they are performing given maintenance operations suggested by the model.

These new capabilities, which will be developed collaboratively with HawAI.tech in the context of project MOPSOS, will support the paradigm shift of our service offering and is expected to boost our revenues by +30% by 2027. This alone would include a market of 2,000+ chips/year for HawAI.tech.

Last, we would like to stress that the reasons making HawAI.tech is the right partner for Savoye go beyond technological achievements. We share a common vision for frugal, distributed, explainable and efficient AI architectures. The team is well connected to the best academic minds in the country and beyond giving them the possibility to help partners test and adopt their technology in the best possible conditions.

Please do feel free to reach out should you need any further information.

With best regards,

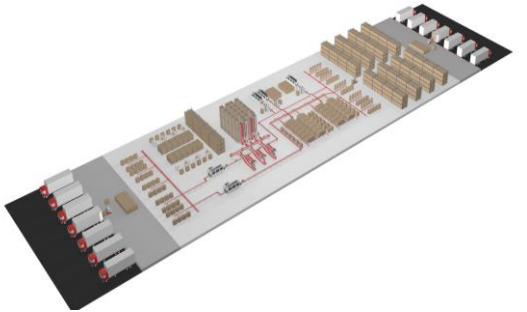
Dr. Aurélien LEGUY
Head of Innovation

Erwan Godot
Company Director & CTO

Savoye needs:

2 000+ units/year

for 5 years min.



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