NEWSLETTER

ISSUE
01
June
2025

Heterogeneously Integrated Multi-Material Photonic Chiplets for Neuromorphic Photonic Transfer Learning AI Engines

HAETAE

In this issue

Consortium

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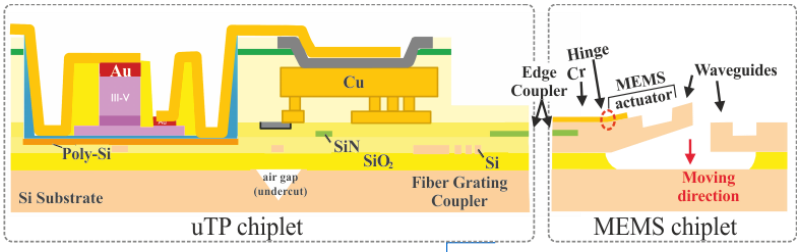
GRANT AGREEMENT
101194393

DURATION
01/10/2024 – 31/09/2027

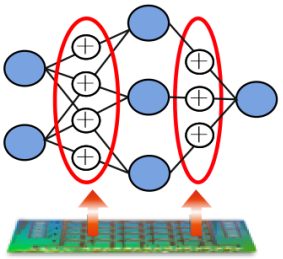
WEBSITE
http://www.haetae.eu

HAETAE at a glance

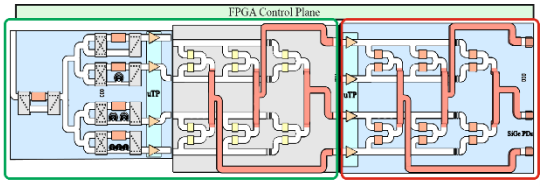
Obj 1 :
Develop multi-material photonic integration platform



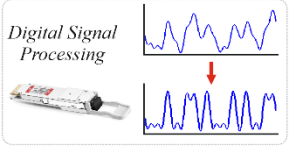
Obj 2 :
"Optics-informed'
co-design approach



Obj 3 :
Deploy multi-chiplet Photonic Transfer Learning Engines



Obj 4 :
Validate in **cybersecurity** and AI-assisted DSP use-case



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Milestones & Technical Progress

05

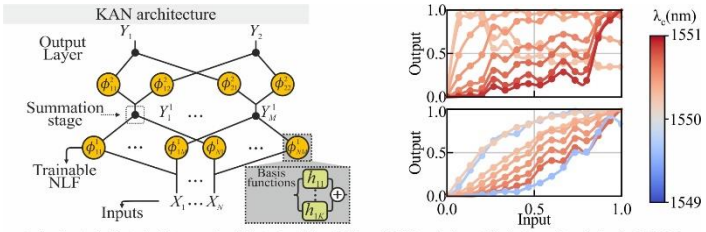
04

03

02

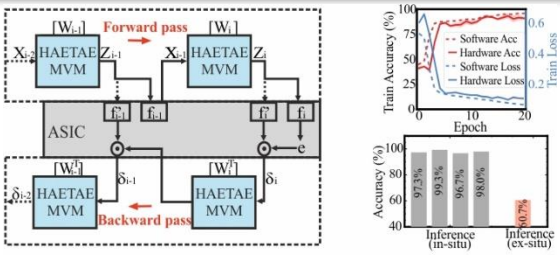
01

Deployment of Photonic Kolmogorov-Arnold Networks



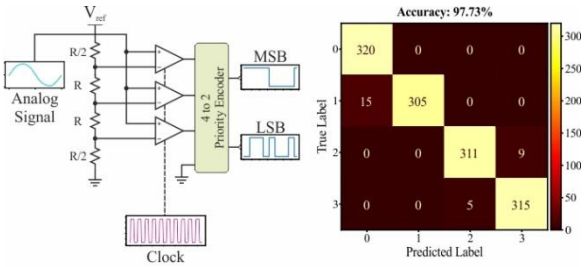
S. Kovaios et. al., "Photonic Kolmogorov Arnold Networks utilizing SOA-based SPM broadening and filtering learnable activations", OFC 2026

In-situ optical backpropagation



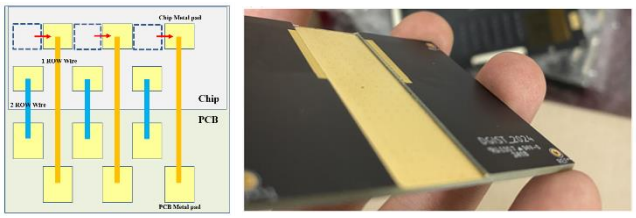
O. Asimopoulos et. al., "Photonic Deep Learning using in-situ optical backpropagation for training photonic linear neural layers", OFC 2026

Photonic Analog-to-Digital Conversion

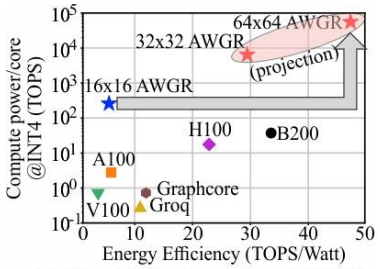


A. Prapas et. al., "Photonic Analog-to-Digital Conversion (ADC) using Photonic Neural Netowrk-assisted Quantization", OFC 2026

Hosting PCB fabrication



HAETAE AWGR PERFORMANCE PROJECTION



A. Tsakyridis et. al., "Hyperdimensional Photonic AI computing", OFC 2026

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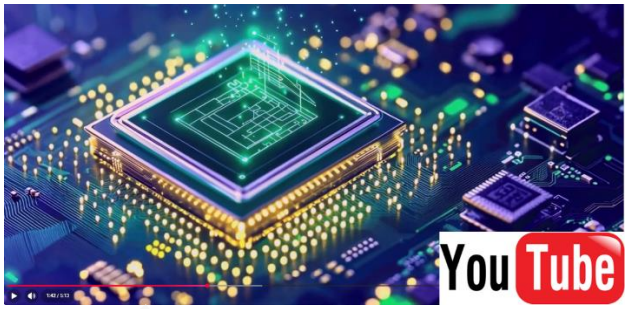
https://www.linkedin.com/company/haetae

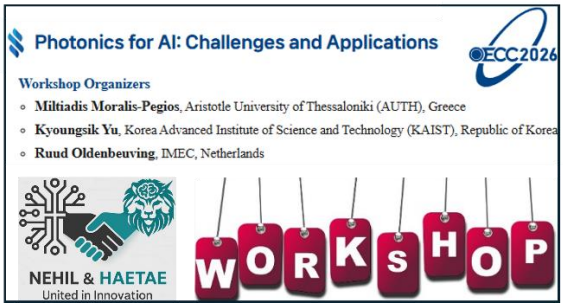
Dissemination & Communication Activities

3 Journals - 1 Invited talk

HAETAE video available on Youtube

Workshop on Photonics for AI





OFC

14:45–15:00 Local Time: 00:45–01:00 — W3C.3
Photonic Kolmogorov Arnold Networks Utilizing SOA-Based SPM Broadening and Filtering Learnable Activations
Presenter: Themistoklis Chrysostomidis, Aristoteleio Panepistimio Thessalonikis
We experimentally demonstrate a range of learnable optical activations using SOA-based SPM-induced spectral bro…
Authors:Stefanos Kovaios, Aristoteleio Panepistimio Thessalonikis / Themistoklis Chrysostomidis, Aristoteleio Pan…

15:15–15:30 Local Time: 01:15–01:30 — W3C.5
Photonic Analog-to-Digital Conversion (ADC) Using Photonic Neural Network-Assisted Quantization
Presenter: Antonios Prapas, Aristoteleio Panepistemio Thessalonikes
We demonstrate a 2-bit photonic ADC architecture using optical sampling and quantization via a silicon photonic …
Authors:Antonios Prapas, Aristoteleio Panepistemio Thessalonikes / Georgios Tsamis, Aristoteleio Panepistemio Th…

10:30 Local Time: 20:30 — Th2A.31
Photonic Deep Learning Using in-Situ Optical Backpropagation for Training Photonic Linear Neural Layers
Presenter: Odysseas Asimopoulos, Aristoteleio Panepistimio Thessalonikis
We demonstrate photonic deep learning with in-situ optical backpropagation using optical matrix-vector multiplic…
Authors:Odysseas Asimopoulos, Aristoteleio Panepistimio Thessalonikis / Stefanos Kovaios, Aristoteleio Panepisti…

14:00–14:30 Local Time: 00:00–00:30 — W3C.1
Hyperdimensional Photonic AI Computing
Presenter: Apostolos Tsakyridis, Aristoteleio Panepistimio Thessalonikis
We discuss our work on hyperdimensional photonic AI accelerators, that leverage time-space- and wavelength-divi…
Authors:Apostolos Tsakyridis, Aristoteleio Panepistimio Thessalonikis / Miltiadis Moralis-Pegios, Aristoteleio Panep…

Invited

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Coordinator (EU/ROK)