Self-Designing Edge Intelligence for Physical AI

Seminar programme

Monday 30 November 2026

DITEN, Università di Genova
Via Opera Pia 11a, 16145 Genova, Italy
Room D3

Programme

16:00–16:05 Welcome and introduction
Prof. Edoardo Ragusa, University of Genoa (Session Chair)
16:05 Seminar by Andrea Mattia Garavagno
ETH Zürich, Switzerland

Abstract

In Physical AI systems, comprehensive training data are rarely available prior to deployment, as collecting rare physical events, fault states, or operational anomalies in advance is often prohibitively expensive or impractical. Consequently, deployed edge models must evolve alongside the gradual, operational accumulation of sensor data. However, conventional edge intelligence remains static, requiring substantial manual intervention and cloud resources to incorporate newly observed data.

This seminar presents a framework for self-designing edge intelligence that distributes neural design directly across the system lifecycle. Leveraging human-in-the-loop validation and lightweight, derivative-free hardware-aware neural architecture search (HW-NAS), the system autonomously adapts and redesigns deep learning models locally on embedded platforms. Operating entirely at the edge without cloud dependency, this paradigm ensures data sovereignty and resource efficiency for resilient cyber-physical systems and intelligent sensor interfaces.

Speaker biography

Andrea Mattia Garavagno is a Postdoctoral Researcher at ETH Zurich, Switzerland. He earned his Ph.D. from the University of Genoa (co-funded by Scuola Superiore Sant'Anna) and served as a Harvard SEAS Fellow in 2025. He co-authored the book "Introduction to Microprocessor-Based Systems Design" (Springer, 2022). His research bridges computer architecture, machine learning, and embedded systems for self-designing edge intelligence.

Participation and contacts

Attendance is free and no registration is required.
Online participation:
https://teams.microsoft.com/meet/3278556054609005?p=LFhq6BVGrVAfVDF4tt

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Organisers: Professors Edoardo Ragusa , Paolo Gastaldo and Maurizio Valle, IEEE CASS North Italy Chapter.