Self-Designing Edge Intelligence for Physical AI

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Università degli studi di Genova, Room D3
Via Opera pia 11a, 16145, Genova



Speaker

Andrea Mattia Garavagno

ETH Zürich, Switzerland

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.

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.

Registration and Contact Information

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

Session Chair: Prof. Edoardo Ragusa, University of Genoa

Contacts: edoardo.ragusa@unige.it

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