

SEMINAR ANNOUNCEMENT

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at 10:00 am
Room Sala Seminari, U14

The End of (TinyML) Incrementalism: Generative AI is Redefining the Very Fabric of the Edge

Speaker

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Abstract

Since TinyML became pervasive at the edge, a major shift has emerged. GANs and Transformers launched the era of large-scale language models, enabling advances such as reasoning over generated content and reducing the need for manual prompt engineering. This evolution accelerated as machines gained the ability to generate their own queries to achieve goals, unlocking the era of "Agentic AI," expected to drive a significant share of internet traffic by 2030. As AI agents increasingly operate on digital information, new orchestration techniques will become essential. Beyond digital interaction, demand for everyday physical assistance is advancing humanoid robotics, marking the next stage of language models: managing end-to-end workloads from heterogeneous sensing to physical actuation, converging in what it is often called "Physical AI". Achieving this requires breakthroughs across algorithms, system architectures, and hardware acceleration. Key enablers include in-memory computing, neuromorphic engineering, energy-efficient chips, and robust tools and frameworks. This talk presents an industry-focused perspective, combining general observations with quantitative examples from internal developments and community advances over the past two years.

Bio

Danilo Pietro Pau has spent about 35 years in System Research at STMicroelectronics. As co-author of over 270 scientific publications, he holds approximately 109 inventions, 80 EU patents, and 72 US patents. After graduating in Electronic Engineering from Politecnico di Milano in 1992, his early career focused on MPEG2 memory reduction and video encoding. He later worked on OpenVG/OpenGL-ES embedded graphics and ISO/IEC standards. Since 2016, his research has focused on computer vision and Tiny AI, driving ST Unified AI Core developments for STM32Cube.AI and the STM32 Developer Cloud. Elevated to IEEE Fellow (2019) and AAIA Fellow (2022), he joined the National Academy of Artificial Intelligence (NAAI) in 2025. He serves as an IEEE Italy Industry Ambassador and has curated three ratified IEEE Milestones. He is a key figure in the TinyML community, he co-chairs the Gen EdgeAI working group. His accolades include the Finmeccanica Innovation Award and the 2026 ST STAR Innovation Award. Certified as a Full Professor (ASN) in Italy, his latest work integrates AI with power electronics, on-device learning, and in-sensor computing.