

IEEE COINS 2026

IEEE International Conference on Omni-layer Intelligent Systems

University of Bologna, Italy | September 7-9, 2026

<https://coinsconf.com>



Call for Papers

The IEEE International Conference on Omni-Layer Intelligent Systems (<https://coinsconf.com>) brings together researchers, engineers, and industry leaders to advance next-generation AI and intelligent systems spanning devices, architectures, and applications. It emphasizes cross-layer co-design, energy-efficient and secure computing, and the responsible integration of AI from embedded and edge platforms to agentic and autonomous systems. COINS serves as a premier forum to exchange ideas, showcase innovations, and shape the future of intelligent, connected, and sustainable technologies. The technical program of IEEE COINS 2026 is organized into four thematic clusters—Enabling Intelligence, Connected Intelligence, Trusted and Autonomous Intelligence, and Human-Aligned and Applied Intelligence—each encompassing multiple tracks that collectively span the entire lifecycle of intelligent systems, from device-level design to large-scale, ethical, and domain-driven deployment:

Cluster 1: Enabling Intelligence (Hardware – Design – Architecture)

1. **Track1:** AI Hardware, Circuits, and Devices
2. **Track2:** AI-Driven Design Automation and Optimization
3. **Track 3:** AI Architectures and Systems Design

Cluster 2: Connected Intelligence (Network – Cloud – IoT)

4. **Track4:** AI-Native Connectivity, Networks, and Distributed Intelligence
5. **Track5:** Cloud, Infrastructure, and Data-Centric Intelligence
6. **Track6:** Internet of Things (IoT) and Cyber-Physical Intelligence

Important Dates:

- Abstract submission: 8 April 2026
- Full paper submission: 15 April 2026
- Special session, workshop, tutorial proposal submission: 29 April 2026
- Acceptance notification: 2 June 2026
- Camera-ready submission: 29 June 2026

Cluster 3: Trusted and Autonomous Intelligence (Security – Agency – Cognition)

7. **Track7:** Secure, Reliable, and Trustworthy AI Systems
8. **Track8:** Agentic and Robotic AI Systems
9. **Track9:** Foundational, Generative, and Cognitive AI

Cluster 4: Human-Aligned and Applied Intelligence (Human – Ethics – Industry)

10. **Track10:** Human-Centered AI, Interaction, and Visualization
11. **Track11:** Responsible, Ethical, and Sustainable AI
12. **Track12:** Vertical Applications in Smart Cities, Industry 4.0, Healthcare, Agriculture, and Emerging Sectors

Featured Program Activities

1. Panels
2. Diversity, Equity, and Inclusion
3. Industrial Talks
4. Workshops/Tutorials
5. Special Sessions
6. Workforce Development



Italy Section



North Chapter - Italy Section



About IEEE COINS

The **IEEE International Conference on Omni-Layer Intelligent Systems (COINS)** unites researchers, engineers, system architects, and industry innovators to advance the science and technology of intelligent systems spanning hardware, software, and artificial intelligence. COINS provides a multidisciplinary forum for understanding, designing, and deploying next-generation intelligent technologies that span from microarchitectures and circuits to large-scale, autonomous, and interconnected platforms. The conference emphasizes **cross-layer co-design, energy-efficient and secure computing, AI-native systems and connectivity, and the responsible integration of intelligence** across physical and digital environments. IEEE COINS encompasses the full continuum of intelligent system innovation, including **AI-centric hardware and architectures, AI-native networking and edge intelligence, cloud and data-centric infrastructures, agentic and robotic autonomy, foundational and cognitive AI models, and human-aligned, ethical, and sustainable intelligence**. It also highlights the transformative role of AI across diverse **applications and vertical domains**—such as **healthcare, manufacturing, energy, transportation, and urban infrastructure**—where intelligent systems enable measurable societal and economic impact. Whether your focus is on enabling technologies, trustworthy deployment, or domain-driven applications, COINS offers a premier platform to exchange ideas, showcase innovations, and shape the future of intelligent, connected, and sustainable systems.

IEEE COINS 2026 – Technical Tracks

The **technical program of IEEE COINS 2026** is organized into four thematic clusters—**Enabling Intelligence, Connected Intelligence, Trusted and Autonomous Intelligence, and Human-Aligned and Applied Intelligence**—each encompassing multiple tracks that collectively span the entire lifecycle of intelligent systems, from device-level design to large-scale, ethical, and domain-driven deployment.

Cluster 1: Enabling Intelligence (Hardware – Design – Architecture)

Track 1: AI Hardware, Circuits, and Devices

This track explores the physical and circuit-level foundations of intelligent computing. Topics include compute-in-memory (CIM/PIM) and near-sensor computing, mixed-signal and analog MAC design, on-chip learning, low-power digital accelerators, and reliability/variation-tolerant architectures. Contributions on heterogeneous 2.5D/3D integration, chiplet/interposer co-design, photonic and quantum devices, and novel materials for AI computing are encouraged.

Keywords: compute-in-memory, PIM/CIM, analog MACs, on-chip learning, heterogeneous integration, chiplets, photonic/quantum AI devices, device reliability.

Track 2: AI-Driven Design Automation and Optimization

This track focuses on machine-learning-enabled EDA and cross-layer optimization. Topics include predictive PnR and timing closure, reinforcement-learning-guided design-space exploration, generative circuit synthesis, formal verification and test (ATPG), yield and cost modeling, and runtime telemetry-driven optimization. Submissions combining HW/SW co-synthesis with AI-assisted reliability and power-performance-area (PPA) trade-offs are especially welcome.

Keywords: ML for EDA, learning-guided PnR, timing closure, formal verification, test/ATPG, multi-objective DSE, HW/SW co-synthesis, telemetry optimization.

Track 3: AI Architectures and Systems Design

This track covers architectural innovations for next-generation AI accelerators and systems. Topics include systolic and dataflow architectures, sparsity/quantization support, NoC/interconnect co-design, HBM/HMC hierarchies, RISC-V and chiplet-based SoCs, compiler/runtime co-optimization, and heterogeneous coherence standards (UCIe). Modeling and evaluation frameworks for scalable inference and training are also encouraged.

Keywords: AI accelerators, systolic/dataflow design, RISC-V, chiplet SoCs, memory-centric architectures, NoC/interconnect, HBM/HMC, compiler/runtime co-design.

Cluster 2: Connected Intelligence (Network – Cloud – IoT)

Track 4: AI-Native Connectivity, Networks, and Distributed Intelligence

This track emphasizes AI-native communication and network intelligence across 6G/7G systems. Topics include semantic and goal-oriented communications, federated and in-network learning, O-RAN RIC (xApps/rApps), integrated sensing, communication, and computation (ISCC), reconfigurable intelligent surfaces (RIS), and digital twins of networks. Research on self-organizing networks, resource allocation, over-the-air aggregation, and field testbeds is

encouraged.

Keywords: AI-native 6G/7G, semantic/goal-oriented comms, federated/in-network learning, RIS/ISAC, O-RAN RIC (xApps/rApps), digital twin networks, self-optimizing networks.

Track 5: Cloud, Infrastructure, and Data-Centric Intelligence

This track addresses AI computing infrastructure and data engineering. Areas include data pipelines, feature stores, vector databases, serverless AI frameworks, LLM serving and inference optimization, virtualization, and sustainability-aware resource management across cloud-edge continua. Work on digital twins for datacenter operations and blockchain-based data provenance is also welcome.

Keywords: cloud/edge orchestration, data engineering, vector DBs, MLOps/LLMOps, model serving, autoscaling/SLA, digital twins, blockchain provenance, sustainability.

Track 6: Internet of Things (IoT) and Cyber-Physical Intelligence

This track examines the convergence of the Internet of Things (IoT), edge intelligence, and cyber-physical systems (CPS) in creating smart, connected, and autonomous environments. It focuses on intelligent sensing and actuation, embedded and edge AI, TinyML, real-time analytics, and time-sensitive networking (TSN) for low-latency and deterministic communication. Topics also include hardware-in-the-loop (HIL) simulation, functional safety, edge–cloud orchestration, and large-scale interoperability across industrial, urban, and critical infrastructure systems. Submissions addressing digital twins, self-adaptive IoT architectures, industrial wireless technologies, or next-generation IoT protocols are particularly encouraged.

Keywords: IoT, cyber-physical systems, edge intelligence, TinyML, smart sensing and actuation, real-time analytics, TSN, HIL, edge–cloud orchestration, interoperability, digital twins, adaptive IoT, industrial IoT, IoT security, smart infrastructure, connected systems.

Cluster 3: Trusted and Autonomous Intelligence (Security – Agency – Cognition)

Track 7: Secure, Reliable, and Trustworthy AI Systems

This track unifies hardware and AI security for trustworthy intelligent systems. Topics include side-channel and fault-injection attacks, model watermarking and supply-chain security, red-teaming and safety cases, privacy-preserving learning, and runtime attestation of edge or cloud AI. Verification, certified robustness, and governed model lifecycles are also in scope.

Keywords: hardware security, AI security, model watermarking, supply-chain assurance, adversarial robustness, privacy (e.g., FL/DP/HE/MPC), runtime attestation, certified robustness.

Track 8: Agentic and Robotic AI Systems

This track covers autonomous and agentic AI in both software and embodied forms. Topics include SLAM, 3D perception, manipulation and grasping, task and motion planning (TAMP), reinforcement learning for control, shared autonomy, multi-robot coordination, and sim-to-real transfer. Submissions on safety-critical deployment, benchmarks, and field validation are encouraged.

Keywords: agentic AI, robotics, autonomy, SLAM, TAMP, shared autonomy, multi-robot coordination, sim-to-real, safety validation.

Track 9: Foundational, Generative, and Cognitive AI

This track spans core algorithmic and model innovations in AI. Topics include foundation and multimodal models (LLMs, VLMs), retrieval-augmented generation (RAG), parameter-efficient fine-tuning (LoRA/QLoRA), reinforcement learning (RL/RLHF/RLAIF), generative design, neurosymbolic reasoning, and cognitive architectures. Work on model efficiency, alignment, verification, and continual learning is encouraged.

Keywords: foundation models, LLMs/VLMs, RAG, LoRA/QLoRA, RL/RLHF/RLAIF, generative design, neurosymbolic reasoning, continual learning, alignment, verification.

Cluster 4: Human-Aligned and Applied Intelligence (Human – Ethics – Industry)

Track 10: Human-Centered AI, Interaction, and Visualization

This track examines human–AI interfaces and decision support systems. Areas include explainable interfaces, uncertainty and provenance visualization, XR/AR/VR for operations and training, conversational UIs, and human-in-the-loop evaluation with cognitive load and ergonomic analysis. Contributions on trust calibration and safety UX are welcome.

Keywords: human-centered AI, explainability, interpretability, uncertainty visualization, XR/AR/VR, provenance UX, human-in-the-loop, trust and safety UX.

Track 11: Responsible, Ethical, and Sustainable AI

This track addresses fairness, accountability, and sustainability in AI lifecycles. Topics include risk management, impact assessment, auditing and reporting (model cards/datasheets), governance and policy frameworks, safety certification, and environmental impact analysis of training and inference. Submissions aligned with NIST AI RMF principles are encouraged.

Keywords: responsible AI, fairness, transparency, risk management, impact assessment, model cards/datasheets, data governance, sustainability metrics, policy compliance.

Track 12: Vertical Applications in Smart Cities, Industry 4.0, Healthcare, Agriculture, and Emerging Sectors

This track focuses on AI-driven applications and vertical domains that demonstrate real-world impact. Topics include digital medicine and healthcare, Industry 4.0 and predictive manufacturing, process control (fabs/chemicals), smart energy and mobility, grid intelligence, logistics and ports, urban digital twins, and resilient infrastructure. Submissions highlighting cross-domain integration and sustainability are encouraged.

Keywords: applied AI, digital medicine, Industry 4.0, predictive maintenance, process control, energy grids, mobility, logistics, smart cities, resilience, sustainability.