

CALL FOR PAPERS

20th IEEE MCSoC 2027

International Symposium on Embedded Multicore/Many-core Systems-on-Chip

20th ANNIVERSARY

May 10–13, 2027 | The University of Electro-Communications, Tokyo, Japan | Hybrid Event

Celebrating its 20th anniversary, the IEEE MCSoC Forum returns to Tokyo for MCSoC 2027, sponsored by IEEE and the IEEE Computer Society TCMM. Under the theme **"The Next Frontier of Heterogeneous Intelligence: Chiplets, Neuromorphic Cores, and Embodied AI"**, MCSoC brings together academia and industry to advance architectures, design tools, and applications of embedded multicore and many-core systems.

Authors are invited to submit original technical, experimental, theoretical, conceptual, or survey papers. Submission implies that at least one author will register and present upon acceptance.

Three Global Summits

2027 MCSoC-ChipletCore Global Summit

Chiplet architectures, die-to-die interconnects, and 2.5D/3D heterogeneous integration.

Summit Chairs: Lichen Weng (Chair), Chun-Ming Huang (Co-Chair)

2027 MCSoC-NeuroCore Global Summit

Neuromorphic systems, spiking neural networks, and brain-inspired computing.

Summit Chairs: A. Yousefzadeh, X. Iturbe, A. Marchisio

2027 MCSoC-EmbodiCore Global Summit

Embodied AI, distributed autonomy, and intelligent physical systems.

Summit Chairs: Mohamad Sawan (Chair)

Conference Highlights

Keynote Talks
Leading experts from academia and industry

Hybrid Format
Join onsite in Tokyo or online

IEEE Xplore
Proceedings in IEEE Xplore and CSDL

Best Paper Awards
Best Paper and Best Student Paper

Organizing Committee

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Full committee: www.mcsoc-forum.org/2027

Paper Submission

Important Dates (Round 1)

Paper Submission: **December 31, 2026**

Notification: **January 31, 2027**

Camera-Ready & Registration: **February 10, 2027**

Submit online via EDAS

https://edas.info/N35724

Scan for the full call, deadlines, and registration

Scopus Indexed

IEEE Xplore

Patron, Host, and Sponsorships

Technical Areas

Original papers are solicited in, but not limited to, the following areas.

20th ANNIVERSARY

01 Programming Techniques for Embedded Multicore/Manycore SoCs

Parallel programming models, compiler support, software optimization, domain-specific languages, runtime systems, and scalable abstractions for heterogeneous manycore platforms.

02 Architectural Innovations in Embedded Multicore/Manycore SoCs

Novel core microarchitectures, advanced memory hierarchies, coherence mechanisms, inter-core communication schemes, and architecture-level optimizations for performance, energy, and reliability.

03 Design Methodologies for Embedded Multicore/Manycore SoCs

System-level design flows, HW/SW co-design, modeling and simulation frameworks, design-space exploration, and rapid prototyping methodologies for complex SoCs.

04 Interconnection Networks for Embedded Multicore/Manycore SoCs

NoC architectures, routing algorithms, topology optimization, congestion control, QoS-aware communication, and emerging interconnect technologies for high-bandwidth, low-latency SoCs.

05 Testing, Security, and Trust in Embedded Multicore/Manycore Systems

Hardware security primitives, trusted execution, fault tolerance, vulnerability analysis, side-channel mitigation, and reliability testing for secure multicore platforms.

06 Design Automation and Low-Power Techniques for Embedded Manycore SoCs

CAD tools, power-aware synthesis, DVFS, clock/power gating, thermal-aware design, and automated optimization flows for energy-efficient manycore architectures.

07 Real-Time Systems for Embedded Multicore/Manycore SoCs

Real-time scheduling, deterministic execution models, mixed-criticality systems, latency-bounded communication, and frameworks ensuring predictability in multicore real-time environments.

08 Operating System Platforms for Real-Time Embedded Applications

RTOS design, virtualization, hypervisors, resource management, isolation mechanisms, multicore scheduling, and OS-level support for safety-critical embedded applications.

09 Application Domains for Embedded Multicore/Manycore SoCs

Automotive systems, robotics, healthcare devices, industrial automation, smart infrastructure, IoT platforms, and domain-specific optimizations leveraging multicore SoCs.

10 Multicore SoCs for Cyber-Physical and Autonomous Systems

Sensor fusion, control loops, real-time autonomy, safety-critical processing, edge intelligence, and compute architectures enabling reliable CPS and autonomous platforms.

11 Hardware Acceleration of AI on Embedded Edge SoCs

AI inference engines, neural network accelerators, dataflow architectures, quantization techniques, compression strategies, and HW/SW co-design for efficient edge AI processing.

12 Machine Learning for Energy-Efficient and Reliable Manycore Systems

ML-based optimization, predictive reliability modeling, adaptive performance tuning, anomaly detection, and learning-driven management of power, thermal, and workload distribution.

13 Chiplet-Based Architectures and Design for Multicore SoCs

Modular chiplet integration, inter-chip communication fabrics, packaging technologies, interoperability standards, and scalable ecosystems for disaggregated SoC design.

14 Neuromorphic and Brain-Inspired Architectures for Multicore SoCs

Spiking neural networks, event-driven processing, asynchronous logic, synaptic memory structures, neuromorphic accelerators, and biologically inspired computing models.

15 3D Integration and Heterogeneous Design for Multicore SoCs

TSV-based stacking, interposers, logic-memory integration, photonic interconnects, thermal management, and heterogeneous integration techniques for ultra-dense SoCs.

16 Sustainable Design and Lifecycle Management for Multicore SoCs

Carbon-aware computing, energy harvesting, recyclable materials, lifecycle optimization, eco-efficient architectures, and sustainability-driven design methodologies for future SoCs.

17 Privacy-Preserving AI Acceleration on Embedded Multicore SoCs

Federated learning, homomorphic encryption, secure multiparty computation, trusted execution environments, and privacy-preserving AI acceleration techniques for embedded systems.

18 Formal Verification and Benchmarking of Multicore SoC Platforms

Model checking, formal proofs, simulation acceleration, standardized benchmarking, reproducible evaluation frameworks, and verification methodologies for complex multicore.

19 Compiler Technologies and Toolchains for Embedded Multicore SoCs

Parallelizing compilers, DSLs, toolchain co-design, intermediate representations, optimization passes for heterogeneous cores, and compiler-driven performance tuning.

Special Sessions

Special sessions on emerging topics are held alongside the main tracks. For the list of sessions and their chairs, please see the website:
www.mcsoc-forum.org/2027

Publications: All accepted and presented papers from the technical tracks, global summits, and special sessions will be published in the IEEE Conference Proceedings, included in IEEE Xplore and the IEEE CSDL, and submitted for indexing in EI Compendex, Scopus, and other major databases. Selected papers may be invited to submit extended versions to affiliated journals.

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