



ACM Transactions on Design Automation of Electronic Systems

Special Issue on Advances in Physical Design Automation

Guest Editors:

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Physical design automation has been a key enabling technology for high-quality and cost-effective integrated circuit design. Recent advances in integrated circuit manufacturing processes and applications have brought a lot of new challenges to physical design. Moore's Law continues to push the limits of process lithography into the deep nanometer regime for better area, performance, and power. Additionally, More-than-Moore technologies add diverse devices and adopt heterogeneous integration to achieve better system-level power-performance-cost tradeoffs and higher design functionality. Thus, tools need to handle complex design constraints and objectives of diverse emerging process technologies like advanced lithography, 2.5D/3D heterogeneous integration, chiplet-based architectures, FinFET/multi-gate devices, photonic devices, superconducting circuits, and quantum circuits. Physical design is also a critical design stage to satisfy the increasingly stringent requirements in power, timing, reliability, and hardware security.

Given the ever-increasing design scale and complexity, it is important for physical design tools to take advantage of computing platforms employing multicore, GPU, FPGA, and AI hardware acceleration. At the same time, the limits of traditional algorithmic approaches are creating new opportunities for machine learning and emerging foundation models, including large language models (LLMs), agentic AI, to automate design decisions and enable adaptive, data-driven optimization. These new challenges necessitate the research and development of new physical design techniques and methodologies.

Topics

The special issue seeks to examine recent advances and innovations for More Moore and More-than-Moore in a physical design context. In addition to submissions from academia, submissions from industry are welcome. More specifically, research papers with an emphasis on the following topics are of particular interest:

- Placement, routing, and ECO
- Advances towards analog design automation
- Physical design for heterogeneous integration
- Physical design for advanced lithography technology
- Hardware security-related physical design
- Physical design for advanced packaging, 2.5D/3D integration, and chiplet-based architectures
- ML-, LLM-, and agentic AI-driven optimization of physical design flows
- Physical design with multicore, GPU, FPGA, and AI hardware acceleration
- Physical design for emerging technologies
(autonomous systems, bio-chips, quantum circuits, superconducting circuits, etc.)

Important Dates

- Open call for papers: April 22nd, 2026
- Submission deadline: July 22nd, 2026
- First-round review decisions: September 22nd, 2026
- Revision submissions due: October 12th, 2026
- Reviews of major revisions completed: November 3rd, 2026
- Notification of final acceptance: November 23rd, 2026
- Publication materials for final manuscript due: December 24th, 2026

Submission Information

Authors are encouraged to submit high-quality original research contributions that will not require major revisions. Please identify clearly the additional material from any original conference paper or workshop paper in your submitted manuscript. Submissions of relevant original work not previously presented at any conference are especially welcome. Concurrent submission to any other conference or journal is grounds for rejection of a manuscript without review. All papers will be fully refereed to the usual journal standards. Submissions should be made through the ACM TODAES submission site (<http://mc.manuscriptcentral.com/todaes>) and formatted according to TODAES author guidelines at: <https://dl.acm.org/journal/todaes/author-guidelines>. Select the paper type "Special Issue on Advances in Physical Design Automation."

For questions and further information, please contact **guest editors at:**

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