



2027 Special Focus

Unconventional Computing: Beyond von Neumann Computing

The ARCS conferences series has a 40-year tradition on reporting leading-edge research in computer architectures and operating systems. Modern workloads particularly AI/ML and Big Data processing, manipulate enormous amounts of data. As data movement increasingly dominates system design, conventional von Neumann architectures face fundamental constraints in performance, efficiency, and sustainability. The focus of the ARCS'27 conference will be on unconventional computing covering computer architectures and computing paradigms that explore alternative ways of representing, storing, and processing information. By relaxing the strict separation of memory and computation, and by exploiting physical phenomena or the intrinsic properties of emerging materials, approaches such as neuromorphic, quantum, reconfigurable, and in-memory computing open alternative approaches to efficient and scalable information processing. We welcome all contributions on hardware architectures (including extensions to classic approaches), operating systems, design tools, as well as programming models, algorithms, and data structures that advance computing efficiency—from von Neumann and beyond.

In addition to the main conference, ARCS will host:

- A special track on Organic Computing.
- A special track on Dependability and Fault Tolerance.
- A PhD forum to present the work of early-stage doctoral students.
- A Group forum for early-career professors, researchers, and consortia to present their research.

The proceedings of ARCS 2027 will be published in the Springer Lecture Notes on Computer Science (LNCS) series. A best paper will be elected by the Program Committee, and the Participants' Favorite Presentation Award will be chosen by the audience. Submission guidelines are available at: <https://arcs-conference.org/submission-guidelines>.

Topics of interest:

Hardware Architectures

- Reconfigurable architectures
- Domain-specific accelerator architectures
- RISC-V and open-source architectures
- AI accelerators
- System-on-chip
- Parallel and distributed systems
- High-performance systems
- Heterogeneous many-core architectures
- Real-time and mixed-criticality systems
- I/O and non-volatile memory
- Energy-efficient architectures
- Smart network technologies
- Dependable and fault-tolerant architectures

Programming Models and Runtime Environments

- Programming models for heterogeneous computing
- Operating systems, algorithms, and data structures for heterogeneous architectures
- System management including but not limited to scheduling, memory management, power/thermal management, and RTOS
- Tools for power monitoring and performance analysis
- Hypervisors and middleware for homogeneous and heterogeneous multi-/many-core computing platforms
- Domain-specific languages and programming models
- Architecture-specific code generation and optimization
- Architectural simulation and emulation

Cross-sectional Topics

- Near- and in-memory computing
- Memory and network compression
- Organic computing
- Pervasive systems
- Autonomous systems
- Application-specific arithmetic
- Approximate computing
- Hardware security
- Safety
- Hardware in the loop
- Optimization and performance analysis

Important Dates

Abstract submission deadline:	December 14, 2026
Paper submission deadline:	December 21, 2026
Notification of acceptance:	February 08, 2027
Camera-ready papers:	February 24, 2027
Conference (in Magdeburg, Germany):	March 09-11, 2027

Organizers

General Co-Chairs:

Thilo Pionteck, Otto von Guericke University Magdeburg, Germany
Sven Tomforde, Christian-Alberts University Kiel, Germany

Proceedings Chair:

Thilo Pionteck, Otto von Guericke University Magdeburg, Germany

Program Committee Co-Chairs

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Publicity and Web Chairs:

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Lars Bauer, Ubitium GmbH, Germany

<https://arcs-conference.org>