# MOCAST

**INTERNATIONAL CONFERENCE ON MODERN CIRCUITS AND SYSTEMS TECHNOLOGIES**

- **11-13 June 2025**
- **Dresden University of Technology (TUD), Dresden, Germany**
- **https://tud.de/ing/mocast2025**

## Special Session Announcement: TRENDS IN MODERN COMPUTER ARITHMETIC AND DIGITAL NUMBER FORMATS

The 14th International Conference on Modern Circuits and Systems Technologies (MOCAST) aims to bring together leading academic and industrial scientists and researchers to exchange and share their knowledge and experiences about all aspects of Circuits and Systems.

**Session Description:**
Innovative approaches for digital signal processing and its hardware implementations are a key aspect to compete with nowadays requirements of modern algorithms and applications. Within this scope, novel and innovative concepts, design strategies as well as implementation techniques of the underlying computer arithmetic and the representation of numbers in the digital domain can be identified as a highly important research field. More precisely, specific characteristics and properties of the given application or the algorithm can be exploited to increase the effective Information per Bit and, consequently, raise the overall hardware performance.

Recently, trends like, e.g. approximate computing (AxC) strategies have led to novel ideas of application-specific arithmetic circuit designs. These measures can be exploited to achieve significant performance gains. For FPGA-based hardware designs, optimized implementation strategies can be considered to achieve an optimal utilization of the underlying fabric. In the field of digital number representations, innovative approaches are currently explored that aim to overcome the drawback to the well-established standards, such as IEEE 754. One prominent approach is given by the so-called Posits and Takum floating-point formats, which have been proven to be highly suitable for machine learning. Other approaches like Sets-of-real-Numbers (SORNs) focus on low-precision number-representations, that, e.g. can be used to efficiently sort out incorrect solution vectors for large optimizations in advance or function as a low-complexity alternative for arithmetic operators, that still deliver "good-enough results".

The goal of the proposed special session is to give a comprehensive overview about the ongoing research work in the field of modern computer arithmetic and digital number formats. Several different emerging topics and corresponding applications will be presented. This session will bring together researchers from different universities and institutions and shed light on these topics in different ways. Moreover, the exchange of knowledge and ideas in the scientific community is strengthened as well as opportunities for future collaboration can be explored.
Also, young scientists are given the opportunity to familiarize themselves with the latest developments, research trends, unresolved issues and perspectives of this research area.

**Special Session Organizers:**
**Jochen Rust**, Hamburg Univ. of Applied Sciences, Germany
**Moritz Bärthel**, University of Bremen, Germany

MOCAST is Technically Sponsored by IEEE. All accepted papers are expected to be included in IEEE Xplore and will be indexed by EI.
Authors of selected accepted papers will be invited to submit extended version of their paper to the MOCAST Special Issue at **Advanced Electronic Materials**.

**Important Dates:**

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| **17.03.2025** Deadline for Regular Paper Submission | **17.03.2025** **Deadline for Special Session Paper Submission** | **17.04.2025** Acceptance Notification for Papers | **24.04.2025** Camera-ready Submission for all Papers | **24.04.2025** Early Bird Registration deadline | **11.-13.06.2025** MOCAST 2025 conference in Dresden |