



## Editorial

## MICPRO DSD 2015 special issue



The 18th Euromicro Conference on Digital System Design (DSD) took place in the city of Funchal, Madeira Island, Portugal, on August 26–28, 2015, organized by the University of Porto with the collaboration of the University of Madeira. The conference addressed all aspects of digital and mixed hardware/software systems from high-level design down to microarchitectures, digital circuits, and VLSI techniques.

The 2015 final program covered a wide variety of topics in the field of digital systems design by providing a set of coherent technical sessions in the conference's main track together with a strong set of Special Sessions. It is a pleasure to express our gratitude to the Special Sessions Chairs for being so active and successful in attracting submissions in new areas, and for managing the review process with care and competence. We were extremely fortunate to count on an exceptional Program Committee composed of active and highly regarded actors in all fields of digital system design. Our thanks to all of them and to the additional reviewers invited to help with this task.

The DSD 2015 conference had 165 paper submissions with authors from 39 countries. From these, 72 were selected for oral presentation. All papers were subject to a rigorous blind review process that averaged more than three reviews per paper.

The extended papers from DSD 2015 in this special issue were chosen from the set of submissions that obtained the highest scores in the conference review process. The extended versions were handled according to the regular journal review process. The diversity of domains represented in this selection clearly shows the breadth of coverage of the conference.

The paper by Skelin et al. add analyzes worst-case performance metrics of parameterized synchronous dataflow models of computation for streaming applications and shows that in many cases the proposed approach enables the derivation of tighter conservative worst-case throughput and latency bounds than nonparametric methods. Their method can also be used to improve the scalability of enumerative analysis techniques.

The use of solid-state storage in high-reliability embedded systems has many advantages but introduces issues of wear-out. The paper by McEwan and Komsul addresses techniques for replacing aged solid-state storage devices in RAID systems so that continuous system reliability is ensured while reducing the performance overhead of the reconstruction process. Data from trace-driven simulations show significant improvements in I/O response time.

The security of modern information and communication systems very much relies on symmetric cryptography. In this context, CAESAR (<http://competitions.cr.yp.to/caesar.html>) is an on-going competition between authenticated encryption schemes, which started with more than fifty candidates. Gross et al. explore the design space for hardware implementations of the third-round candidate Ascon, present solutions that are optimized for different applications with widely different requirements, and show how they can be protected against attacks based on differential power analysis.

In telecommunications, the drive towards 5th generation mobile networks leads to a large number of technical challenges. One of the cornerstones of the new communication systems will be C-RAN (Cloud Radio Access Network). The paper by Santos et al. presents a laboratory platform to support the development and testing of C-RAN compliant features. The proposed modular and flexible testbed provides cost-effective emulation and physical layer implementation based on open FPGA platforms.

The advent of cyber-physical systems, where people and machines interact in real-time, imposes many scientific and technological challenges. Álvarez et al. describe the on-going AX-IOM project, which researches new hardware/software architectures for cyber-physical systems and explores key use cases like smart video surveillance and smart living. The paper presents the software layers together with the results of preliminary experiments.

We believe that these papers represent an advancement of the state of the art of their respective domains and appropriately display the high overall quality of the work presented at DSD 2015. It is our hope that readers will find here new ideas and fresh perspectives for their own work.

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