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IFIP was founded in 1960 under the auspices of UNESCO, following the first World Computer Congress held in Paris the previous year. A federation for societies working in information processing, IFIP's aim is two-fold: to support information processing in the countries of its members and to encourage technology transfer to developing nations. As its mission statement clearly states:

IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.


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Carolina Metzler · Pierre-Emmanuel Gaillardon ·
Giovanni De Micheli · Carlos Silva-Cardenas ·
Ricardo Reis (Eds.)


VLSI-SoC: New Technology Enabler


27th IFIP WG 10.5/IEEE International Conference
on Very Large Scale Integration, VLSI-SoC 2019
Cusco, Peru, October 6–9, 2019
Revised and Extended Selected Papers

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Preface

This book contains extended and revised versions of the highest quality papers, presented during the 27th edition of the IFIP/IEEE WG10.5 International Conference on Very Large Scale Integration (VLSI-SoC 2019), a global System-on-Chip Design and CAD conference. The 27th edition of the conference was held October 6–9, 2019, at the Cuzco Convention Center, Cuzco, Peru. Previous conferences have taken place in Edinburgh, Scotland (1981); Trondheim, Norway (1983); Tokyo, Japan (1985); Vancouver, Canada (1987); Munich, Germany (1989); Edinburgh, Scotland (1991); Grenoble, France (1993); Chiba, Japan (1995); Gramado, Brazil (1997); Lisbon, Portugal (1999); Montpellier, France (2001); Darmstadt, Germany (2003); Perth, Australia (2005); Nice, France (2006); Atlanta, USA (2007); Rhodes Island, Greece (2008); Florianopolis, Brazil (2009); Madrid, Spain (2010); Kowloon, Hong Kong (2011), Santa Cruz, USA (2012), Istanbul, Turkey (2013), Playa del Carmen, Mexico (2014), Daejeon, South Korea (2015), Tallin, Estonia (2016), Abu Dhabi, UAE (2017); and Verona, Italy (2018).

The purpose of this conference, which was sponsored by IFIP TC 10 Working Group 10.5, the IEEE Council on Electronic Design Automation (CEDA), and the IEEE Circuits and Systems Society, with the cooperation of ACM SIGDA, is to provide a forum for the presentation and discussion of the latest academic and industrial results and developments as well as the future trends in the field of System-on-Chip (SoC) design, considering the challenges of nano-scale, state-of-the-art, and emerging manufacturing technologies. In particular, VLSI-SoC 2019 addressed cutting-edge research fields like Heterogeneous Mobile Architectures, Reliability and Security of MPSoCs, Radiation Effects, Binary Neural Networks, Variability, Self-Test, and Test Generation. The chapters of this new book in the VLSI-SoC series continue its tradition of providing an internationally acknowledged platform for scientific contributions and industrial progress in this field.

For VLSI-SoC 2019, 28 papers out of 82 submissions were selected for oral presentation and 15 for poster presentation. Out of these 28 full papers presented at the conference as oral presentations, 15 papers were chosen by a Selection Committee to have an extended and revised version included in this book. The selection process of these papers considered the evaluation scores during the review process as well as the review forms provided by members of the Technical Program Committee and the session chairs as a result of the presentations.

The chapters of this book have authors from Brazil, Canada, Cyprus, England, Estonia, Germany, India, Israel, Italy, Portugal, Switzerland, Turkey, and England. The Technical Program Committee for the regular tracks comprised 89 members from 29 countries.

VLSI-SoC 2019 was the culmination of the work of many dedicated volunteers: paper authors, reviewers, session chairs, invited speakers, and various committee chairs. We thank them all for their contributions.

This book is intended for the VLSI community at large, and in particular the many colleagues who did not have the chance to attend the conference. We hope you will enjoy reading this book and that you will find it useful in your professional life and for the development of the VLSI community as a whole.

June 2020

Carolina Metzler
Pierre-Emmanuel Gaillardon
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Organization

The IFIP/IEEE International Conference on Very Large Scale Integration System-on-Chip (VLSI-SoC 2019) took place during October 6–9, 2019, at the Cuzco Convention Center, Cuzco, Peru. VLSI-SoC 2019 was the 27th in a series of international conferences, sponsored by IFIP TC 10 Working Group 10.5 (VLSI), IEEE CEDA, and ACM SIGDA. The Organization Committee of the conference consisted of the following colleagues:

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