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Applied Reconfigurable Computing

Architectures, Tools, and Applications

14th International Symposium, ARC 2018
Santorini, Greece, May 2–4, 2018
Proceedings

Springer

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Preface

Reconfigurable computing platforms offer increased performance gains and energy efficiency through coarse-grained and fine-grained parallelism coupled with their ability to implement custom functional, storage, and interconnect structures. As such, they have been gaining wide acceptance in recent years, spanning the spectrum from highly specialized custom controllers to general-purpose high-end programmable computing systems. The flexibility and configurability of these platforms, coupled with increasing technology integration, have enabled sophisticated platforms that facilitate both static and dynamic reconfiguration, rapid system prototyping, and early design verification. Configurability is emerging as a key technology for substantial product life-cycle savings in the presence of evolving product requirements, standards, and interface specifications.

The growth of the capacity of reconfigurable devices, such as FPGAs, has created a wealth of new research opportunities and intricate engineering challenges. Within the past decade, reconfigurable architectures have evolved from a uniform sea of programmable logic elements to fully reconfigurable systems-on-chip (SoCs) with integrate multipliers, memory elements, processors, and standard I/O interfaces. One of the foremost challenges facing reconfigurable application developers today is how to best exploit these novel and innovative resources to achieve the highest possible performance and energy efficiency; additional challenges include the design and implementation of next-generation architectures, along with languages, compilers, synthesis technologies, and physical design tools to enable highly productive design methodologies.

The International Applied Reconfigurable Computing (ARC) symposium series provides a forum for dissemination and discussion of ongoing research efforts in this transformative research area. The series of editions started in 2005 in Algarve, Portugal. The second edition of the symposium (ARC 2006) took place in Delft, The Netherlands, and was the first edition of the symposium to have selected papers published as a Springer LNCS (*Lecture Notes in Computer Science*) volume. Subsequent editions of the symposium have been held in Rio de Janeiro, Brazil (ARC 2007), London, UK (ARC 2008), Karlsruhe, Germany (ARC 2009), Bangkok, Thailand (ARC 2010), Belfast, UK (ARC 2011), Hong Kong, SAR China (ARC 2012), California, USA (ARC 2013), Algarve, Portugal (ARC 2014), Bochum, Germany (ARC 2015), Rio de Janeiro, Brazil (ARC 2016), and Delft, The Netherlands (ARC 2017).

This LNCS volume includes the papers selected for the 14th edition of the symposium (ARC 2018), held in Santorini, Greece, during May 2–4, 2018. The symposium attracted a large number of very good papers, describing interesting work on reconfigurable computing-related subjects. A total of 78 papers were submitted to the symposium from 28 countries. In particular, the authors of the submitted papers are from the following countries: Australia (3), Belgium (5), Bosnia and Herzegovina (4), Brazil (24), China (22), Colombia (1), France (3), Germany (40), Greece (44),

India (10), Iran (4), Ireland (4), Italy (5), Japan (22), Malaysia (2), The Netherlands (5), New Zealand (1), Norway (2), Poland (3), Portugal (3), Russia (8), Singapore (7), South Korea (2), Spain (4), Sweden (3), Switzerland (1), UK (18), and USA (11).

Submitted papers were evaluated by at least three members of the Program Committee. The average number of reviews per submission was 3.7. After careful selection, 29 papers were accepted as full papers (acceptance rate of 37.2%) and 22 as short papers. These accepted papers led to a very interesting symposium program, which we consider to constitute a representative overview of ongoing research efforts in reconfigurable computing, a rapidly evolving and maturing field. In addition, the symposium included a special session dedicated to funded research projects. The purpose of this session was to present the recent accomplishments, preliminary ideas, or work-in-progress scenarios of on-going research projects. Nine EU- and national-funded projects were selected for presentation in this session.

Several people contributed to the success of the 2018 edition of the symposium. We would like to acknowledge the support of all the members of this year's symposium Steering and Program Committees in reviewing papers, in helping the paper selection, and in giving valuable suggestions. Special thanks also to the additional researchers who contributed to the reviewing process, to all the authors who submitted papers to the symposium, and to all the symposium attendees. In addition, special thanks to Dr. Christos Antonopoulos from the Technological Educational Institute of Western Greece for organizing the research project special session. Last but not least, we are especially indebted to Anna Kramer from Springer for her support and work in publishing this book and to Pedro C. Diniz from INESC-ID, Lisbon, Portugal, for his strong support regarding the publication of the proceedings as part of the LNCS series.

February 2018

Nikolaos Voros
Michael Huebner
Georgios Keramidas
Diana Goehringer

Organization

The 2018 Applied Reconfigurable Computing Symposium (ARC2018) was organized by the Technological Educational Institute of Western Greece, by the Ruhr-Universität, Germany, and by the Technische Universität Dresden, Germany. The symposium took place at Bellonio Conference Center in Fira, the capital of Santorini in Greece.

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