Preface

More than ever, FDL is the place for researchers, developers, industry designers, academia, and EDA tool companies to present and to learn about the latest scientific achievements, practical applications and users experiences in the domain of specification and design languages. FDL covers the modeling and design methods, and their latest supporting tools, for complex embedded systems, systems on chip, and heterogeneous systems.

FDL 2009 is the 12th in a series of events that were held in Lausanne, Lyon, Tübingen, Marseille, Frankfurt am main, Lille, Barcelona and Stuttgart. In 2009, FDL was organized in the attractive south of France area of Sophia Antipolis, together with the DASIP (Design and Architectures for Signal and Image Processing) Conference and the SAME (Sophia Antipolis MicroElectronics) Forum.

All submitted papers were carefully reviewed to build a program with 27 full and 10 short contributions. From these, the Program Committee selected a shorter list, based on the evaluations of the reviewers, and the originality and relevance of the work that was presented at the Forum. The revised, and sometimes extended versions of these contributions constitute the chapters of this volume.

The four parts of this book reflect the organization of FDL 2009 around four Technical Areas. Each one of them is preceded by an introduction by the Technical Area Chair.

Part I, UML and MDE for Embedded System, addresses model driven methods, based on the Unified Modeling Language, for performance analysis, validation and verification. The two chapters involve the use of the MARTE (Modeling and Analysis of Real-Time and Embedded systems) UML profile, standardized in late 2009.

Part II, C/C++-Based System Design, corresponds to the area that attracted the largest number of submissions, and contains six chapters. Most of them use SystemC, or extensions to SystemC, for modeling complex designs and performing exploration of architectural alternatives, performance evaluation, validation and synthesis. Yet, two chapters advocate the use of functional languages for those tasks.
Part III, Embedded Analog and Mixed-Signal System Design, includes two chapters that address the modeling and validation of heterogeneous and RF circuits, by means of dedicated simulators based on SystemC-AMS and VHDL-AMS.

Part IV, Assertion Based Design, Verification & Debug, contains four chapters that present new concepts and methods that take as input formal properties for verification, synthesis and stimuli generation. The use of assertions is no longer limited to the register transfer level, and is now made available for transaction-level models.

As editor of this book, I am indebted to the many persons who made it possible to appear. I would like to thank all the reviewers who evaluated the articles submitted to FDL 2009, and provided detailed and well-argued comments from which the best papers could be selected. The four Technical Area Chairs deserve special acknowledgement; they are, from Part I to Part IV: Pierre Boulet (Université Lille 1, France), Frank Oppenheimer (OFFIS, Oldenburg, Germany), Sorin A. Huss and Hans Eveking (both from Technical University of Darmstadt, Germany). Many thanks are due also to the authors, who worked hard to revise and improve their contributed article.

As a result this book presents extensions to standard specification and description languages, as well as new language-based design techniques and methodologies to solve the challenges raised by mixed signal and multi-processor systems on a chip. It is intended as a reference for researchers and lecturers, as well as a state of the art milestone for designers and CAD developers. It covers a broad range of design objectives and modeling levels, and should be useful to the design and CAD community.

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