## Contents

Preface ................................................. ix  
Introduction .......................................... xi  

Part I Real-Time and Performance Analysis in Heterogeneous Embedded Systems

1 Performance Prediction of Distributed Platforms .............. 3  
   Lothar Thiele and Thomas Lühr  

2 SystemC-Based Performance Analysis of Embedded Systems ... 27  
   Virgin Sahin, Oliver Bringsmeier, Matthias Reineke,  
   Alexander Vield, and Wolfgang Frenzel  

3 Formal Performance Analysis for Real-Time Heterogeneous Embedded Systems ........................................ 97  
   Simon Schleicher, Jonas Rieh, Rajeev Nair, Raman Jain,  
   Arnaud Hamon, and Jeff Trivedi  

4 Model-Based Framework for Schedulability Analysis  
   Using OPNET 4.5 ........................................ 93  
   Alexander, David, Jacob, Ian, Kim, and Ivan  

5 Modeling and Analysis Framework for Embedded Systems ........................................ 128  
   Jan Skomedal, Michael, and Auke  

6 TAU Time Simulation Tool for Performance Analysis  
   of Real-Time Embedded Systems  ........................................ 145  
   Anton, Cerin, and Karl-Erik Åström
Part II Design Tools and Methodology for Multicore System-on-Chip

7 MPSoC: Platform Mapping Tools for Data-Dominated Applications ................................................. 179

Pier G. Davila, Chirag Bhatia, Michel Lamotte, Erwin de Boer, Pablo Chadal,
Chao Du, Koushik Chakraborty, and Michael Sorensen

8 Reconfigurable Embedded Software Design Methodology for Multiprocessor Embedded Systems .............. 207

Sanjaya Naik

9 Programming Models for MPSoC ............................................. 231

Katerina Papazoglou and Ahmed Fahmy

10 Platform-Based Design and Frameworks

METOPIDS and METRO II .................................................. 259

Kees Boeije, Massimo Strollo, Alberto Angelico, Athanasios Diamandopoulos,
Tamer Alpaydin, Roberto Passerone, Alexandre Prata, Athina
Sargentis, Vincenzo Sarrà, Alexei Tsimring, Yuval Tarnawski,
Gianni Valenzuela, and Qi Zhou

11 Reconfigurable Multicore Architectures for Streaming Applications ............................................. 315

Gernot M. Seiler, Arndt B. J. Aschenbrenner, Gernot K. Seunaris,
and Ioan W. M. Farcășu

12 FPGA Platforms for Embedded Systems .................................. 381

Stephen Newcomer

Part III Design Tools and Methodology for Multidomain Embedded Systems

13 Modeling, Verification, and Testing Using Timed and Hybrid Automata .......................................... 389

Shane Franks and Dan Ding

14 Semantics of Domain-Specific Modeling Languages ................................................ 437

Elena Jackson, Raja Wadhwa, Joseph Pfeifer,
and Jason Sifakis

15 Multi-Viewpoint State Machines for Rich Component Models .................................................. 657

Alberto Bertogna, Rodolfo Celli, and Roberto Passerone

Contents