Preface

This textbook is intended to give an introduction to and an overview of state-of-the-art techniques in the design of complex embedded systems.

The book title is **SAMOS** for two major reasons. First, it tries to focus on the actual distinct, yet important problem fields of **S**ystem-Level design of embedded systems, including mapping techniques and synthesis, **A**rchitectural design, **Mo**deling issues such as specification languages, formal models, and finally **S**imulation.

The second reason is that the volume includes a number of papers presented at a workshop with the same name on the Island of Samos, Greece, in July 2001.

In order to receive international attention, a number of reputed researchers were invited to this workshop to present their current work. Participation was by invitation only. For the volume presented here, a number of additional papers where selected based on a call for papers. All contributions were refereed. This volume presents a selection of 18 of the refereed papers, including 2 invited papers.

The textbook is organized according to four topics: The first is **A) System-Level Design and Simulation**. In this section, we present a collection of papers that give an overview of the challenging goal to design and explore alternatives of embedded system implementations at the system-level. One paper gives an overview of models and tools used in system-level design. The other papers present new models to describe applications, provide models for refinement and design space exploration, and for tradeoff analysis between cost and flexibility of an implementation.

Section **B) Compiler and Mapping Technology** presents new techniques to exploit parallelism in future embedded systems, i.e., by mapping computation intensive applications to hardware. The papers presented include new theoretical results for scheduling loop-like programs with subprogram structure, for partitioning programs with affine data dependences, and for mapping and simulating programs as a network of Kahn-processes.

Topic **C) Embedded Processors and Architectures** is related to novel processor and architecture principles for future embedded systems. One paper gives an overview of architectures for multimedia applications and presents future trends in this direction. Two papers deal with the possibility of hardware reconfiguration as a means to adapt the processor to a certain application or domain: One gives an overview of current development in microcoded reconfigurable processors, the other deals with architecture adaptions in order to obtain energy efficient wireless image computations. A final paper is dedicated to caches.

Finally, Topic **D) Applications** presents some interesting applications of embedded computing systems including the design of a run-time reconfigurable Web-camera.

October 2001   E.F. Deprettere, J. Teich, and S. Vassiliadis

Organization

The workshop SAMOS 2001 took place from July 16–18, 2001 at the Research and Teaching Institute of East Aegean (INEAG) in Agios Konstantinos on the Island of Samos, Greece.

Organizing Committee

Ed F. Deprettere   (Leiden University, The Netherlands)
Bob Hertzberger   (University of Amsterdam, The Netherlands)
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Sponsoring Institutions

The workshop has been financially supported by the Technology Foundation STW and PROGRESS, the program for research on embedded systems and software. PROGRESS is an initiative of the Dutch organization for scientific research (NWO), the Ministry of Economic Affairs, and the STW.

The workshop has been dedicated to the memory of Jean-Pierre Veen.