EMBEDDED SYSTEM DESIGN: TOPICS, TECHNIQUES AND TRENDS

IFIP TC10 Working Conference: International Embedded Systems Symposium (IESS), May 30 – June 1, 2007, Irvine (CA), USA

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Springer Academic Publishers
New York/Boston/Dordrecht/London/Moscow

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Preface

This book presents the technical program of the International Embedded Systems Symposium (IESS) 2007. Timely topics, techniques and trends in embedded system design are covered by the chapters in this book, including design methodology, specification and modeling, embedded software and hardware synthesis, networks-on-chip, distributed and networked systems, and system verification and validation. Particular emphasis is paid to automotive and medical applications. A set of actual case studies and special aspects in embedded system design are included as well.

Over recent years, *embedded systems* have gained an enormous amount of processing power and functionality. Many of the formerly external components can now be integrated into a single System-on-Chip. This tendency has resulted in a dramatic reduction in the size and cost of embedded systems. As a unique technology, the design of embedded systems is an essential element of many innovations.

Embedded systems meet their performance goals, including real-time constraints, through a combination of special-purpose hardware and software components tailored to the system requirements. Both the development of new features and the reuse of existing intellectual property components are essential to keeping up with ever demanding customer requirements. Furthermore, design complexities are steadily growing with an increasing number of components that have to cooperate properly. Embedded system designers have to cope with multiple goals and constraints simultaneously, including timing, power, reliability, dependability, maintenance, packaging and, last but not least, price.

The significance of these constraints varies depending on the application area a system is targeted for. Typical embedded applications include multi-media, automotive, medical, and communication devices.

The *International Embedded Systems Symposium (IESS)* is a unique forum to present novel ideas, exchange timely research results, and discuss the state of the art and future trends in the field of embedded systems. Contributors and participants from both industry and academia take active part in this symposium. The IESS conference is organized by the Computer Systems Technology committee (TC10) of the International Federation for Information Processing (IFIP).

IESS is a true inter-disciplinary conference on the design of embedded systems. Computer Science and Electrical Engineering are the predominant academic disciplines concerned with the topics covered in IESS, but many applications also involve civil, mechanical, aerospace, and automotive engineering, as well as various medical disciplines.

In 2005, IESS was held for the first time in Manaus, Brazil. In this initial installment, IESS 2005 was very successful with 30 accepted papers ranging from specification to embedded systems application. *IESS 2007* is the second installment of this conference, establishing a regular bi-annual schedule.

IESS 2007 is held in Irvine, California, at the Beckman Conference Center of the National Academies of Sciences and Engineering. The conference center is located on the campus of the University of California at Irvine. Co-located with one of the leading research institutions on embedded systems, the Center for Embedded Computer Systems at UC Irvine, this IESS conference is a unique venue to establish and foster research relations and collaboration between academic researchers and industry representatives worldwide.

The articles presented in this book are the result of a rigorous double-blind review process implemented by the technical program committee. Out of a total of 64 valid submissions, 35 papers have been accepted for publication, yielding an overall acceptance rate of 54.7%.

Confident about a strong technical program, we look forward to a fruit- and successful IESS 2007 conference,

Achim Rettberg, Mauro C. Zanella, Franz J. Rammig, Rainer Dömer, and Andreas Gerstlauer

Irvine, California, March 2007

Acknowledgements

First and foremost, we thank our sponsors ZF Lemförder GmbH, the Office of Research at the University of California at Irvine (UCI), and the Center for Embedded Computer Systems (CECS) at UCI for their generous financial support of this conference. Without these contributions, IESS 2007 would not have been possible in its current form.

We would also like to thank IFIP as organizational body for the promotion and support of the IESS conference.

Last but not least, we thank the authors for their interesting research contributions and the members of the technical program committee for their valuable time and effort in reviewing the articles.

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Embedded System Design: Topics, Techniques and Trends

Edited by Achim Rettberg, Mauro C. Zanella, Rainer Dömer, Andreas Gerstlauer, and Franz J. Rammig

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