Preface

Pao-Ann Hsiung

Department of Computer Science and Information Engineering,
National Chung Cheng University, Chiayi, Taiwan
E-mail: hpa@computer.org E-mail: pahsiung@cs.ccu.edu.tw

Biographical notes: Pao-Ann Hsiung received the BS Degree in Mathematics and the PhD Degree in Electrical Engineering from the National Taiwan University, Taipei, Taiwan, ROC, in 1991 and 1996, respectively. From 1996 to 2000, he was a post-doctoral researcher at the Academia Sinica, Taipei. From February 2001 to July 2002, he was an Assistant Professor in the Department of Computer Science and Information Engineering, National Chung Cheng University, Taiwan. From August 2002 to July 2007, he was an Associate Professor. He is currently a Professor. He is a senior member of the IEEE, a senior member of ACM, and a life member of IICM. He has published more than 120 papers in international journals and conferences on reconfigurable computing, real-time embedded systems, and formal verification. He is currently an editor of several journals.

With the growing demands of users, not only are real-time embedded systems characterised by varied software functions, but also a large portion of their functionalities are performed by software. Though software is considered to be more flexible and easily changeable and adaptable, this also implies a greater risk of design defects which become all the more pronounced in real-time embedded systems that play important roles in the daily lives of human beings, such as the financial market, telecommunication, transportation, and information appliances, just to name a few. The growing concern of malfunctioning software in such systems necessitates deeper understanding of and intensive researches in this area. This special issue comes at this critical point of time to help researchers and engineers focus on this topic that will have a strong impact on us, as a whole community. This issue touches only the tip of an iceberg in this area of research; however, it signifies an important step in fostering further seminal researches in this area.

The special issue presents a broad spectrum on novel and emerging state-of-art techniques in model-driven architecture design for avionics systems, real-time virtual machines for avionics software, programming languages such as Real-Time Java and Esterel, application design for distributed real-time systems, formal verification methods, performance analysis, multimedia scheduling, high-assurance system design, and file-system design. Half of these contributions were invited and half were accepted from a number of submissions to this special issue. The editorial board members and volunteer reviewers worked hard to generate at least three reviews for each submission, with some having four or even five reviews.

In this special issue, we see technology breakthroughs in the form of advances in avionics software design techniques, in analysis techniques for the analysis of hard real-time embedded software, in language-based software compilation, and in more adaptive scheduling techniques for multimedia systems. We believe that this special issue will be an important reference for the present and future real-time embedded software designers and researchers both from academia and industry.