

Real-Time and Embedded Technology and Applications Symposium (RTAS '05)

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Overview

RTAS '05 is the eleventh in the series of annual meetings devoted to the integration of academic and industrial perspectives on theory and practice of real-time and embedded systems. This year, RTAS was held in San Francisco, California, on March 7-10. Recent previous meetings were held in Montreal (2004), Washington, D.C. (2003), San Jose, California (2002), Taipei, Taiwan (2001). The choice of location this year was motivated by co-location with the Embedded Systems Conference (ESC), an important annual industry forum and trade show. RTAS participants were encouraged to visit ESC exhibits in order to get a first-hand understanding of the direction in which the industry evolves and to further foster interactions between academia and industry.

Tarek Abdelzaher (University of Virginia), David Sharp (Boeing), and Greg Bollella (Sun Microsystems) were the General co-Chairs of the symposium. Oleg Sokolsky (University of Pennsylvania), Seongsoo Hong (Seoul National University), Douglas Stuart (Boeing), and Christopher Gill (Washington University) served as Program co-Chairs. The symposium was sponsored by the IEEE Computer Society. The National Science Foundation provided support for student participation in the form of travel grants.

The area of real-time and embedded systems is currently enjoying a resurgence of interest. Practically all major conferences in the area are receiving record number of submissions. Researchers are increasingly exploring connections with other areas, such as sensor networks and ubiquitous computing. Two major forces are shaping this burst of activity. On the one hand, embedded systems are permeating every aspect of our lives, from aircraft and cars to mobile phones and microwaves, embedded systems. These embedded systems operate under resource and timing constraints that vary greatly with each application domain and require

different approaches to satisfy these constraints. On the other hand, multimedia applications, which emerged as a dominant source of Internet traffic, are a driving force in research on adaptation and dynamic resource management under soft real-time constraints. These two very different forces ensure that the spectrum of topics addressed by researchers in the real-time and embedded areas is very broad.

Technical Program

Submissions to RTAS were accepted in four separate areas: real time and embedded technology, which is considered the core area for the conference, quality of service in open systems, model-driven real-time and embedded systems, and real-time and embedded application. One of the Program co-Chairs was responsible for each submission area. Areas had separate program committees and reviewing processes. However, uniform acceptance criteria were applied to all tracks. A total of 158 papers has been submitted to RTAS. Of these, 68 were submitted to the core track; QoS track received 24 submissions; the track on model-driven systems has 34 submissions, and 32 papers were submitted to the applications track. Of these submissions, the program committees selected 22, 10, 13, and 8 papers, respectively, for a total of 53 accepted papers. Once the selections were made separately by area, accepted papers were grouped together into a cohesive program.

In addition to the submitted papers, the RTAS technical program included two invited talks, a panel, and a work-in-progress session. Invited presentations were given by Namsung Woo (Siemens Electronics) and Kenneth Butts (Toyota Technical Center). The two presentations highlighted the difference in the needs of the embedded systems in the domains of portable electronics and automotive systems. The panel was also devoted to bridging the gap between industry and academia. Organized by William Milam (Ford), the

panel concentrated its attention on technology transfer and adoption. The panelists included representatives from the industry and tool vendors and talked about obstacles to adopting technology developed in academia. Finally, the work-in-progress session was devoted to promising recent developments that may not yet be ready for a rigorous publication but contain intriguing ideas that may have a stimulating effect on the community, at the same time benefitting themselves from early exposure to discussions at a conference. Paper presentations and the panel were organized into sixteen sessions. Parallel sessions were run on the first day meetings.

An award for the best paper with a student as the first author was presented to Jupyung Lee for the paper “Lazy Locking Technique for Improving Real-time Performance of Embedded Linux by Prediction of Timer Interrupt” (co-authored with Kyu-Ho Park).

The technical program of RTAS was supplemented by three workshops that preceded the main event. FALSE-II: 2nd Workshop on High-Performance Fault-Adaptive Large-Scale Embedded Real-Time Systems was organized by Jae C. Oh (Syracuse University). This two-day workshop combined paper presentations with a demonstration of a large-scale embedded system being developed at the Fermi National Accelerator Laboratory. IWSSPS: International Workshop on Software Support for Portable Storage was organized by San Lyul Min (Seoul National University). It highlighted the fact that modern storage devices are embedded systems with unusual, but no less stringent, resource constraints. Finally, WIA: International Workshop on Wireless and Industrial Automation, organized by Deji Chen (Emerson Process Management), concentrated on the application of wireless communication technology in the industrial setting.

Conference Participation

A total of 135 people attended RTAS. In addition, 23 people attended workshops only. Approximately half of them were students. Large participation provided for continuous animated discussions in the halls, in addition to well-attended session. A large number of RTAS participants also took advantage of the free admission pass to the exhibits floor of the ESC. A shuttle bus was provided by RTAS to connect to the ESC site, which was approximately 1.5 miles away from the RTAS site. Many people preferred to get to ESC on foot, walking through the lively neighborhoods of San Francisco.

Acknowledgements

Many people joined their forces to make this conference a success. Local arrangements were made by Scott Brandt (UC Santa Cruz), along with his students and his assistant Ma Xiong. Wei Zhao (Texas A&M University) served as the Finance Chair. Linda Buss, as always, took excellent care of the registration process. The RTAS series are guided by the Technical Committee on Real-Time Systems (TC-RTS) of the IEEE Computer Society. The organizers are grateful for the helpful comments to the TC-RTS Chairs: Insup Lee (University of Pennsylvania), who held the position in 2004 when most of the ground work has been done, and Wei Zhao, the current TC-RTS Chair.