Table of Contents

Proceedings of the 19th Euromicro Conference on Real-Time Systems

ECRTS 2007

Message from the Program Chair .................................................................viii
Organizing Committee ................................................................................ix
Program Committee ..................................................................................x
Reviewers ..................................................................................................xi

Keynote Talks

From Model-Driven Development to Model-Driven Engineering ..................3
Bran Selic, IBM Canada

Real-time Requirements of Media Control Applications .............................4
Francisco Gómez-Molinero, Visual Tools, Spain

Research Opportunities in the IST Thematic Priority of the 7th Framework Program ................................................5
Mercè Griera i Fisa, European Commission

Session 1: Scheduling and Schedulability Analysis

EDZL Scheduling Analysis .......................................................................9
Michele Cirinei and Theodore P. Baker

The Space of EDF Feasible Deadlines ...................................................19
Enrico Bini and Giorgio Buttazzo

A Delay Composition Theorem for Real-Time Pipelines ..........................29
Praveen Jayachandran and Tarek Abdelzaher

New Schedulability Conditions for Real-Time Multiframe Tasks ...............39
Wan-Chen Lu, Kwei-Jay Lin, Hsin-Wen Wei, and Wei-Kuan Shih
Session 2: Multiprocessor Scheduling

The Global Feasibility and Schedulability of General Task Models on Multiprocessor Platforms........................................51
Nathan Fisher and Sanjoy Baruah

Integrating Hard/Soft Real-Time Tasks and Best-Effort Jobs on Multiprocessors.............................................................61
Björn B. Brandenburg and James H. Anderson

Tardiness Bounds for FIFO Scheduling on Multiprocessors.................................................................................................71
Hennadiy Leontyev and James H. Anderson

Session 3: Control and Energy Management

Statistical QoS Guarantee and Energy-Efficiency in Web Server Clusters........................................................................83
Luciano Bertini, Julius C.B. Leite, and Daniel Mossé

Dynamic Speed and Sensor Rate Adjustment for Mobile Robotic Systems........................................................................93
Ala’ Qadi, Steve Goddard, Jiangyang Huang, and Shane Farritor

On Controllability and Feasibility of Utilization Control in Distributed Real-Time Systems..............................................103
Xiaorui Wang, Yingming Chen, Chenyang Lu, and Xenofon Koutsoukos

Thermal Faults Modeling Using a RC Model with an Application to Web Farms............................................................113
Alexandre P. Ferreira, Daniel Mossé, and Jae C. Oh

Session 4: Wireless Network Scheduling

A Time Division Beacon Scheduling Mechanism for IEEE 802.15.4/Zigbee Cluster-Tree Wireless Sensor Networks..........................125
Anis Koubâa, André Cunha, and Mário Alves

On Scheduling and Real-Time Capacity of Hexagonal Wireless Sensor Networks.................................................................136
K. Shashi Prabh and Tarek F. Abdelzaher

An Integrated Scheduling and Retransmission Proposal for Firm Real-Time Traffic in IEEE 802.11e .....................................146
Douglas Dimi Demarch and Leandro Buss Becker

Session 5: Timing Analysis

Cache-Aware Timing Analysis of Streaming Applications..................................................................................................159
Samarjit Chakraborty, Tulika Mitra, Abhik Roychoudhury, Lothar Thiele, Unmesh D. Bordoloï, and Cem Derdiyok

Isabelle Puaut and Damien Hardy

WCET-Directed Dynamic Scratchpad Memory Allocation of Data .........................................................................................179
Jean-François Deverge and Isabelle Puaut
Session 6: Quality of Service Management

Co-Scheduling Variable Execution Time Requirement Real-Time Tasks and Non-Real-Time Tasks
Abhishek Singh and Kevin Jeffay

Memory Resource Management for Real-Time Systems
Audrey Marchand, Patricia Balbastre, Ismael Ripoll, Miguel Masmano, and Alfons Crespo

Probabilistic Admission Control to Govern Real-Time Systems under Overload
Claude-Joachim Hamann, Michael Roitzsch, Lars Reuther, Jean Wolter, and Hermann Härtig

Session 7: Scheduling in Networks and Multicore Platforms

On Dominating Set Allocation Policies in Real-Time Wide-Area Distributed Systems
Chengdu Huang, Tarek Abdelzaher, and Xue Liu

Composition Techniques for Tree Communication Schedules
Madhukar Anand, Sebastian Fischmeister, and Insup Lee

A Hybrid Real-Time Scheduling Approach for Large-Scale Multicore Platforms
John M. Calandrino, James H. Anderson, and Dan P. Baumberger

Session 8: Fixed-Priority Scheduling

Supporting Deliberative Real-Time AI Systems: A Fixed Priority Scheduling Approach
Yanching Chu and Alan Burns

Worst-Case Response Time Analysis of Real-Time Tasks under Fixed-Priority Scheduling with Deferred Preemption Revisited
Reinder J. Bril, Johan J. Lukkien, and Wim F.J. Verhaegh

Extending Rate Monotonic Analysis with Exact Cost of Preemptions for Hard Real-Time Systems
Patrick Meumeu Yomsi and Yves Sorel

Casting Preemptive Time Petri Nets in the Development Life Cycle of Real-Time Software
Laura Carnevali, Luigi Sassoli, and Enrico Vicario

Author Index