Table of Contents

Message from the Program Chair..............................................................................................................ix
Outstanding Paper Awards.........................................................................................................................x
Workshops...................................................................................................................................................xi
Keynote Speakers ......................................................................................................................................xii
Program Committee..................................................................................................................................xiv
Reviewers ...................................................................................................................................................xv

Multiprocessors

Outstanding Paper Award: Fair Lateness Scheduling: Reducing Maximum Lateness in G-EDF-Like Scheduling 3
  Jeremy P. Erickson and James H. Anderson

U-EDF: An Unfair But Optimal Multiprocessor Scheduling Algorithm for Sporadic Tasks 13
  Geoffrey Nelissen, Vandy Berten, Vincent Nélis, Joël Goossens, and Dragomir Milojevic

Partitioned Packing and Scheduling for Sporadic Real-Time Tasks in Identical Multiprocessor Systems 24
  Jian-Jia Chen and Samarjit Chakraborty

Outstanding Paper Award: Task Assignment Algorithms for Two-Type Heterogeneous Multiprocessors 34
  Gurulingesh Raravi, Björn Andersson, Konstantinos Bletsas, and Vincent Nélis
Networks and Distributed Systems
A Sensitivity Analysis of Two Worst-Case Delay Computation Methods for SpaceWire Networks
Thomas Ferrandiz, Fabrice Frances, and Christian Fraboul
Deriving Monitoring Bounds for Distributed Real-Time Systems
Moritz Neukirchner, Steffen Stein, and Rolf Ernst
Control-Quality Optimization for Distributed Embedded Systems with Adaptive Fault Tolerance
Soheil Samii, Unmesh D. Bordoloi, Petru Eles, Zebo Peng, and Anton Cervin
Worst-Case Backlog Evaluation of Avionics Switched Ethernet Networks with the Trajectory Approach
Henri Bauer, Jean-Luc Scharbarg, and Christian Fraboul

Timing Analysis, Caches, and Scratchpads
Measurement-Based Probabilistic Timing Analysis for Multi-path Programs
Liliana Cucu-Grosjean, Luca Santinelli, Michael Houston, Code Lo, Tullio Vardanega, Leonidas Kosmidis, Jaume Abella, Enrico Mezzetti, Eduardo Quiñones, and Francisco J. Cazorla
Relational Cache Analysis for Static Timing Analysis
Sebastian Hahn and Daniel Grund
Replacement Policies for a Function-Based Instruction Memory: A Quantification of the Impact on Hardware Complexity and WCET Estimates
Stefan Metzlaff and Theo Ungerer
Optimal Program Partitioning for Predictable Performance
Jack Whitham and Neil Audsley

Mixed Criticality
Outstanding Paper Award: Bounding and Shaping the Demand of Mixed-Criticality Sporadic Tasks
Pontus Ekberg and Wang Yi
The Preemptive Uniprocessor Scheduling of Mixed-Criticality Implicit-Deadline Sporadic Task Systems
S. Baruah, V. Bonifaci, G. D'Angelo, H. Li, A. Marchetti-Spaccamela, S. van der Ster, and L. Stougie
Relaxing Mixed-Criticality Scheduling Strictness for Task Sets Scheduled with FP
François Santy, Laurent George, Philippe Thierry, and Joël Goossens
Outstanding Paper Award: Global Mixed-Criticality Scheduling on Multiprocessors .......................................................... 166
Haohan Li and Sanjoy Baruah

Scheduling I

An Analytical Bound for Probabilistic Deadlines ................................................................. 179
Luigi Palopoli, Daniele Fontanelli, Nicola Manica, and Luca Abeni

Hardness Results for Static Priority Real-Time Scheduling ............................................. 189
Martin Stigge and Wang Yi

Real-Time Competitive Environments: Truthful Mechanisms for Allocating a Single Processor to Sporadic Tasks .......................................................... 199
Anwar Mohammadi, Nathan Fisher, and Daniel Grosu

Generalized Fixed-Priority Scheduling with Limited Preemptions ....................................... 209
Reinder J. Bril, Martijn M.H.P. van den Heuvel, Uğur Keskin, and Johan J. Lukkien

Resource Access and Reconfiguration

Supporting Nested Locking in Multiprocessor Real-Time Systems .................................... 223
Bryan C. Ward and James H. Anderson

Parallel-Task Scheduling on Multiple Resources ................................................................. 233
Mike Holenderski, Reinder J. Bril, and Johan J. Lukkien

An Algorithm for Online Reconfiguration of Resource Reservations for Hard Real-Time Systems ........................................................................... 245
Pratyush Kumar, Nikolay Stoimenov, and Lothar Thiele

Timing Analysis for Mode Switch in Component-Based Multi-mode Systems ................... 255
Yin Hang and Hans Hansson

GPUs

Robust Real-Time Multiprocessor Interrupt Handling Motivated by GPUs ..................... 267
Glenn A. Elliott and James H. Anderson

Makespan Computation for GPU Threads Running on a Single Streaming Multiprocessor ........................................................................... 277
Kostiantyn Berezovskyi, Konstantinos Bletsas, and Björn Andersson

Supporting Preemptive Task Executions and Memory Copies in GPGPUs ........................ 287
Can Basaran and Kyoung-Don Kang
Multiprocessors and Mixed Criticality

Memory Access Control in Multiprocessor for Real-Time Systems with Mixed Criticality .......................................................... 299

Heechul Yun, Gang Yao, Rodolfo Pellizzoni, Marco Caccamo, and Lui Sha

Schedulability Analysis of Mixed-Criticality Systems on Multiprocessors .......................................................... 309

Risat Mahmud Pathan

Techniques Optimizing the Number of Processors to Schedule Multi-threaded Tasks .......................................................... 321

Geoffrey Nelissen, Vandy Berten, Joël Goossens, and Dragomir Milojevic

Semi-Partitioned Hard-Real-Time Scheduling under Locked Cache Migration in Multicore Systems .......................................................... 331

Mayank Shekhar, Abhik Sarkar, Harini Ramaprasad, and Frank Mueller

Scheduling II

Computing First-to-First Propagation Delays through Sequences of Fixed-Priority Periodic Tasks .......................................................... 343

Rodney R. Howell

Schedulability Analysis of Periodic Tasks Implementing Synchronous Finite State Machines .......................................................... 353

Haibo Zeng and Marco Di Natale

Non-preemptive Scheduling with History-Dependent Execution Time .......................................................... 363

Björn Andersson, Sagar Chaki, Dionisio de Niz, Brian Dougherty, Russell Kegley, and Jules White

Author Index ............................................................................................................................................ 373