2016 28th Euromicro Conference on Real-Time Systems (ECRTS 2016)

Toulouse, France
5-8 July 2016

IEEE Catalog Number: CFP16376-POD
ISBN: 978-1-5090-2812-2

Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16376-POD
ISBN (Print-On-Demand):	978-1-5090-2812-2
ISBN (Online):	978-1-5090-2811-5
ISSN:	2159-3817

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2016 28th Euromicro Conference on Real-Time Systems

ECRTS 2016

Table of Contents

Message from the Conference Chairs viii
Conference Organizers x
Program Committee xi
Reviewers xii
Artifact Evaluation xiii
Keynote Speakers xiv

Session 1: Memory Contention & Overhead

Minimizing DRAM Rank Switching Overhead for Improved Timing Bounds and Performance 3
Leonardo Ecco, Adam Kostrzewa, and Rolf Ernst

Contention-Free Execution of Automotive Applications on a Clustered Many-Core Platform 14
Matthias Becker, Dakshina Dasari, Borislav Nicolić, Benny Akesson, Vincent Nélis, and Thomas Nolte

A New Approach for Limited Preemptive Scheduling in Systems with Preemption Overhead 25
Mitra Nasri, Geoffrey Nelissen, and Gerhard Fohler

Session 2: Task Synchronization & Suspension

Lightweight Real-Time Synchronization under P-EDF on Symmetric and Asymmetric Multiprocessors 39
Alessandro Biondi and Björn B. Brandenburg

Multiprocessor Real-Time Locking Protocols for Replicated Resources 50
Catherine E. Nemitz, Kecheng Yang, Ming Yang, Pontus Ekberg, and James H. Anderson

A Unifying Response Time Analysis Framework for Dynamic Self-Suspending Tasks 61
Jian-Jia Chen, Geoffrey Nelissen, and Wen-Hung Huang

Session 3: Networks

Urgency-Based Scheduler for Time-Sensitive Switched Ethernet Networks 75
Johannes Specht and Soheil Samii

Reducing the Contention Experienced by Real-Time Core-to-I/O Flows over a Tilera-Like Network on Chip 86
Laure Abdallah, Mathieu Jan, Jérôme Ermont, and Christian Fraboul

Anomaly Detection Using Inter-Arrival Curves for Real-Time Systems 97
Mahmoud Salem, Mark Crowley, and Sebastian Fischmeister

Session 4: Mixed-Criticality Systems

Maximizing Parallelism without Exploding Deadlines in a Mixed Criticality Embedded System 109
Antoine Blin, Cédric Courtaud, Julien Sopena, Julia Lawall, and Gilles Muller

Mixed-Criticality Scheduling with I/O 120
Eric Missimer, Katherine Missimer, and Richard West

Scheduling Mixed-Criticality Systems to Guarantee Some Service under All Non-erroneous Behaviors 131
Sanjoy Baruah, Alan Burns, and Zhishan Guo

Session 5: Timing Analysis I

A Framework for the Derivation of WCET Analyses for Multi-core Processors 141
Michael Jacobs, Sebastian Hahn, and Sebastian Hack

Efficient Worst-Case Execution Time Analysis of Dynamic Branch Prediction 152
Wolfgang Puffitsch

Session 6: Scheduling & Analysis

Non-work-conserving Non-preemptive Scheduling: Motivations, Challenges, and Potential Solutions 165
Mitra Nasri and Gerhard Fohler

Schedulability Analysis of Synchronous Digraph Real-Time Tasks 176
Morteza Mohaqeqi, Jakaria Abdullah, Nan Guan, and Wang Yi

Session 7: Timing Analysis II

Achieving Appropriate Test Coverage for Reliable Measurement-Based Timing Analysis 189
Stephen Law and Iain Bate

Extreme Value Theory for Estimating Task Execution Time Bounds: A Careful Look 200
George Lima, Dário Dias, and Edna Barros

Session 8: Multiprocessors

ILP-Based Approaches to Partitioning Recurrent Workloads Upon Heterogeneous Multiprocessors 215
Sanjoy K. Baruah, Vincenzo Bonifaci, Renato Bruni, and Alberto Marchetti-Spaccamela

Sleep Scheduling for Energy-Savings in Multi-core Processors 226
Sandeep D'Souza, Anand Bhat, and Ragunathan (Raj) Rajkumar

Multiprocessor Real-Time Scheduling with Hierarchical Processor Affinities 237
Vincenzo Bonifaci, Björn Brandenburg, Gianlorenzo D'Angelo, and Alberto Marchetti-Spaccamela

Session 9: Outstanding Papers

Partitioned Multiprocessor Fixed-Priority Scheduling of Sporadic Real-Time Tasks 251
Jian-Jia Chen

Cache-Persistence-Aware Response-Time Analysis for Fixed-Priority Preemptive Systems 262
Syed Aftab Rashid, Geoffrey Nelissen, Damien Hardy, Benny Akesson, Isabelle Puaut, and Eduardo Tovar

PROSA: A Case for Readable Mechanized Schedulability Analysis 273
Felipe Cerqueira, Felix Stutz, and Björn B. Brandenburg

Author Index 285