

2017 IEEE 20th International Symposium on Real-Time Distributed Computing (ISORC 2017)

**Toronto, Ontario, Canada
16-18 May 2017**



**IEEE Catalog Number: CFP17175-POD
ISBN: 978-1-5386-1575-1**

**Copyright © 2017 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 is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17175-POD
ISBN (Print-On-Demand):	978-1-5386-1575-1
ISBN (Online):	978-1-5386-1574-4
ISSN:	1555-0885

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

CURRAN ASSOCIATES INC.
proceedings
.com

2017 IEEE 20th International Symposium on Real-Time Distributed Computing

ISORC 2017

Table of Contents

Message from the General Chairs	viii
Message from the Program Chairs	ix
Organizing Committee	xi
Program Committee	xii
Keynote Abstracts	xiii

Data Analytics

Hardware Support for Histogram-Based Performance Analysis of Embedded Systems	1
<i>Thomas Ballenthin, Boris Dreyer, Christian Hochberger, and Simon Wegener</i>	
Essential Data Elements: Extraction and Recovery	11
<i>Xiteng Liu</i>	
Real-Time, Non-intrusive Instrumentation and Monitoring of Standards-Based Event-Based Applications	20
<i>Geetha R. Satyanarayana, LiRen Tu, Nyalia Lui, and James H. Hill</i>	
Short Paper: Towards Low-Cost Indoor Localization Using Edge Computing Resources	28
<i>Shweta Prabhat Khare, Janos Sallai, Abhishek Dubey, and Aniruddha Gokhale</i>	

Energy Management

Extensible Energy Planning Framework for Preemptive Tasks	32
<i>Jin Hyun Kim, Deepak Gangadharan, Oleg Sokolosky, Axel Legay, and Insup Lee</i>	
In the Heat of Conflict: On the Synchronisation of Critical Sections	42
<i>Stefan Reif, Timo Hönig, and Wolfgang Schröder-Preikschat</i>	

Communication

Responsive Task for Real-Time Communication	52
<i>Hiroyuki Chishiro, Kohei Osawa, and Nobuyuki Yamasaki</i>	
Expected Completion Time Aware Message Scheduling for UM-BUS Interconnected System	60
<i>Jiqin Zhou, Weigong Zhang, Keni Qiu, Ruiying Bai, Ying Wang, and Xiaoyan Zhu</i>	
Determining the Communication Load for Self-Building Embedded Systems Based on Artificial DNA	67
<i>Uwe Brinkschulte</i>	

Execution-Time Predictability

Improving Performance of Single-Path Code through a Time-Predictable Memory Hierarchy	76
<i>Bekim Cilku, Wolfgang Puffitsch, Daniel Prokesch, Martin Schoeberl, and Peter Puschner</i>	
A Dynamic Memory Management Unit for Real Time Systems	84
<i>Nicholas Harvey-Lees-Green, Morteza Biglari-Abhari, Avinash Malik, and Zoran Salcic</i>	
A Controller for Dynamic Partial Reconfiguration in FPGA-Based Real-Time Systems	92
<i>Luca Pezzarossa, Martin Schoeberl, and Jens Sparsø</i>	
Static WCET Analysis of GPUs with Predictable Warp Scheduling	101
<i>Yijie Huangfu and Wei Zhang</i>	

Testing Frameworks

A Reordering Framework for Testing Message-Passing Systems	109
<i>Milad Irannejad, Guy Martin Tchamgoue, and Sebastian Fischmeister</i>	
A CAN Restbus HiL Elevator Simulator Based on Code Reuse and Device Para-Virtualization	117
<i>Carlos-F. Nicolas, Iban Ayestaran, Tomaso Poggi, Goiuria Sagardui, and Jose-Maria Martin</i>	

Resilience in CPS

RIAPS: Resilient Information Architecture Platform for Decentralized Smart Systems	125
<i>Scott Eisele, Istvan Mardari, Abhishek Dubey, and Gabor Karsai</i>	

A Self-Healing Framework for Building Resilient Cyber-Physical Systems	133
<i>Denise Ratasich, Oliver Höftberger, Haris Isakovic, Muhammad Shafique, and Radu Grosu</i>	
ViDAQ: A Framework for Monitoring Human Machine Interfaces	141
<i>Harsh V. P. Singh and Qusay H. Mahmoud</i>	

Outstanding Papers

Multi-mode P-FRP Task Scheduling	150
<i>Xingliang Zou, Albert M. K. Cheng, Carlos Rincon, and Yu Jiang</i>	
An End-to-End Toolchain: From Automated Cost Modeling to Static WCET and WCEC Analysis	158
<i>Volkmar Sieh, Robert Burlacu, Timo Hönig, Heiko Janker, Phillip Raffeck, Peter Wägemann, and Wolfgang Schröder-Preikschat</i>	
A Model Driven Approach for Cardiac Pacemaker Design Using a PRET Processor	168
<i>Nathan Allen, Hammond Pearce, Partha Roop, and Reinhard von Hanxleden</i>	

Resource Scheduling

A Cache-Coherent Heterogeneous Architecture for Low Latency Real Time Applications	176
<i>Michel Gémieux, Yvon Savaria, Jean-Pierre David, and Guchuan Zhu</i>	
A Soft Real-Time Scheduling Engine for Cost Reduction in Freemium Companies	185
<i>Alex Magalhaes, Luciana Rech, and Ricardo Moraes</i>	
An Analysis of Lazy and Eager Limited Preemption Approaches under DAG-Based Global Fixed Priority Scheduling	193
<i>Maria A. Serrano, Alessandra Melani, Sebastian Kehr, Marko Bertogna, and Eduardo Quiñones</i>	
Finding a Steady State Point for Fixed Priority Independent Periodic Real-Time Tasks with Arbitrary Given Release Offsets	203
<i>Yue Qin, Xingliang Zou, Albert M. K. Cheng, and Yu Jiang</i>	
Author Index	207