

**2016 IEEE/ACM 20th
International Symposium on
Distributed Simulation and Real
Time Applications (DS-RT 2016)**

**London, United Kingdom
21-23 September 2016**



**IEEE Catalog Number: CFP16186-POD
ISBN: 978-1-5090-3506-9**

**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:	CFP16186-POD
ISBN (Print-On-Demand):	978-1-5090-3506-9
ISBN (Online):	978-1-5090-3505-2
ISSN:	1550-6525

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

2016 IEEE/ACM 20th International Symposium on Distributed Simulation and Real Time Applications

DS-RT 2016

Table of Contents

Message from the Chairs.....	viii
Organising Committee.....	x
Program Committee.....	xi
Steering Committee.....	xiii
Reviewers.....	xiv
Acknowledgements.....	xv
Keynotes.....	xvi

Session 1: Large Scale Simulation and HPC

Elasticity Based Scheduling Heuristic Algorithm for Cloud Environments	1
<i>Ali Al Buhussain, Robson Eduardo De Grande, and Azzedine Boukerche</i>	
Benchmark Generation and Simulation at Extreme Scale	9
<i>Mahesh Lagadapati, Frank Mueller, and Christian Engelmann</i>	
FlipSphere: A Software-Based DRAM Error Detection and Correction Library for HPC	19
<i>David Fiala, Frank Mueller, and Kurt B. Ferreira</i>	

Session 2: Agent-Based Simulation

Investigating a Science Gateway for an Agent-Based Simulation Application Using REPAST	29
<i>Adedeji O. Fabiyi, Simon J. E. Taylor, Anastasia Anagnostou, Mario Torrisi, and Roberto Barbera</i>	
Fault-Tolerant Adaptive Parallel and Distributed Simulation	37
<i>Gabriele D'Angelo, Stefano Ferretti, Moreno Marzolla, and Lorenzo Armaroli</i>	
Agents+Control: A Methodology for CPSs	45
<i>Franco Cicirelli, Libero Nigro, and Paolo F. Sciammarella</i>	

Session 3: Parallel Simulation

A Lock-Free O(1) Event Pool and Its Application to Share-Everything PDES Platforms	53
<i>Romolo Marotta, Mauro Ianni, Alessandro Pellegrini, and Francesco Quaglia</i>	
Enhanced Null Message Algorithm for Hybrid Parallel Simulation Systems with Large Disparity in Time Step	61
<i>Bin Wang, Yanlong Zhai, Zishuo Wang, Han Zhang, and Duzheng Qing</i>	
Parallel Discrete-Event Simulation on Data Processing Engines	69
<i>Kazuyuki Shudo, Yuya Kato, Takahiro Sugino, and Masatoshi Hanai</i>	
Link Partitioning in Parallel Simulation of Scale-Free Networks	77
<i>Vy Thuy Nguyen and Richard Fujimoto</i>	

Session 4: Distributed Simulation

Deriving LVC State Synchronization Parameters from Interaction Requirements	85
<i>Jeremy R. Millar, Douglas D. Hodson, and Richard Seymour</i>	
Combining Interest Management and Dead Reckoning: A Hybrid Approach for Efficient Data Distribution in Multiplayer Online Games	92
<i>Iryanto Jaya, Elvis S. Liu, and Youfu Chen</i>	
Promoting a-priori Interoperability of HLA-Based Simulations in the Space Domain: The SISO Space Reference FOM Initiative	100
<i>Björn Möller, Alfredo Garro, Alberto Falcone, Edwin Z. Crues, and Daniel E. Dexter</i>	

Session 5: Agent-Based Modelling and Real-Time Applications

A Data-driven Methodology for Agent Based Exploration of Customer Retention	108
<i>Chidozie Mgbemena, David Bell, and Nurul Saleh</i>	
Realisation of Navigation Concepts for the Multi-agent Flood Algorithm for Search & Rescue Scenarios Using RFID Tags	112
<i>Florian Blatt and Helena Szczerbicka</i>	
Spatially-Intensive Decision Tree Prediction of Traffic Flow across the Entire UK Road Network	116
<i>Henry Crosby, Paul Davis, and Stephen A Jarvis</i>	

Session 6: Simulation and the Cloud

RA2: Predicting Simulation Execution Time for Cloud-Based Design Space Explorations	120
<i>Ta Nguyen Binh Duong, Jinghui Zhong, Wentong Cai, Zengxiang Li, and Suiping Zhou</i>	
An HLA-Based Cloud Simulator for Mobile Cloud Environments	128
<i>Shichao Guan, Robson Eduardo De Grande, and Azzedine Boukerche</i>	

Session 7: Real-Time Systems

Modelling and Verification of Mutual Exclusion Algorithms	136
<i>Franco Cicirelli and Libero Nigro</i>	
Real-Time Scheduling of Reconfigurable Distributed Embedded Systems with Energy Harvesting Prediction	145
<i>Wiem Housseyni, Olfa Mosbahi, Mohamed Khalgui, and Maryline Chetto</i>	
Local Data Management with Multi-aura Visibility Filtering for 3D Content Streaming	153
<i>Elvis S. Liu and Aditi Rungta</i>	

Session 8: Simulation for Intelligent Transportation Systems

A Low-Cost IoT Application for the Urban Traffic of Vehicles, Based on Wireless Sensors Using GSM Technology	161
<i>Hugo Nugra, Alejandra Abad, Walter Fuertes, Fernando Galarraga, Hernan Aules, Cesar Villacis, and Theofilos Toulkeridis</i>	
Distributed/Parallel Genetic Algorithm for Road Traffic Network Division Using a Hybrid Island Model/Step Parallelization Approach	170
<i>Tomas Potuzak</i>	
Simulation of Traffic Network Re-organization Operations	178
<i>Mohammad Al-Zinati and Rym Z. Wenkster</i>	

Session 9: Case Studies

Cloud Services for Modeling and Simulation: A Simulation of a Chemical GasDiffusion in the Cloud	187
<i>Seongwoo Hwangbo and Kangsun Lee</i>	
Architecture-Based Synthesis of 1D-3D Models for Verification and Validation	189
<i>Elias Allegaert, Yves Lemmens, Stefan Dutré, Alfredo Garro, and Marco Inzillo</i>	
Demonstrating Open Science for Modeling & Simulation Research	191
<i>Simon J. E. Taylor, Adedeji Fabiyi, Anastasia Anagnostou, Roberto Barbera, Mario Torrisi, Rita Ricceri, and Bruce Becker</i>	
Author Index	193