2011 IEEE/ACM 15th International Symposium on Distributed Simulation and Real Time Applications

(DS-RT 2011)

Salford, United Kingdom
4 – 7 September 2011

Editors:

David Roberts
Mark Pullen

Georgios Theodoropoulos
Nick Avis

IEEE Catalog Number: CFP11186-PRT
ISBN: 978-1-4577-1643-0
2011 15th IEEE/ACM International Symposium on Distributed Simulation and Real Time Applications

DS-RT 2011

Table of Contents

Message from the General Co-Chairs .................................................................viii
Message from the Program Co-Chairs ...............................................................ix
Program Committee .........................................................................................x
Reviewers ........................................................................................................xi
Steering Committee .........................................................................................xii
Advisory Board ...............................................................................................xiii
DS-RT 2011 Tutorial .........................................................................................xiv

Theme 1: Distributed Simulation

Session 1: Keynote

Symbiotic Simulation and Its Application to Complex Adaptive Systems .............3
Stephen John Turner

Session 2: Large Scale and Agent-Based Simulation

Predictive Dynamic Load Balancing for Large-Scale HLA-based Simulations ........4
Robson Eduardo De Grande and Azzedine Boukerche

Expression-Level Parallelism for Distributed Spice Circuit Simulation ................12
Dylan Pfeifer and Andreas Gerstlauer

A Multi-scale Agent-Based Distributed Simulation Framework for Groundwater Pollution Management .................................................................18
Susanne I. Schmidt, Cristian Plooreanu, Bart Craenen, Rae Mackay, Jan-Ulrich Kreft, and Georgios Theodoropoulos

Distributed Simulation of Situated Multi-agent Systems .....................................28
Franco Cicirelli, Andrea Giordano, and Libero Nigro
Session 3: Interest Management and Group Communication
A Parallel Interest Matching Algorithm for Distributed-Memory Systems ..................................................36
Elvis S. Liu and Georgios K. Theodoropoulos
Error-Resilient Routing for Supporting Multi-dimensional Range Query in HD Tree ........................................44
Yunfeng Gu and Azzedine Boukerche

Session 4: Short Papers and Posters
Performance Characterization on Mobile Phones for Collaborative Augmented Reality (CAR) Applications ..............................................................52
Victor Fernandez Bauset, Juan M. Orduña, and Pedro Morillo

Theme 2: Virtual Reality and Virtual & Telepresent Humans

Session 5: Keynote
4D Performance Modelling and Animation ..................................................................................................57
Adrian Hilton

Session 6: Interaction
Contextual Interaction Support in 3D Worlds ..................................................................................................58
Norman Murray
Controlling Viewpoint from Markerless Head Tracking in an Immersive Ball Game Using a Commodity Depth Based Camera .........................................................64
Stefan Greuter and David J. Roberts

Session 7: System
A Modular Architecture for an Interactive Real-Time Simulation and Training Environment for Satellite On-Orbit Servicing .................................................................72
Robin Wolff, Carsten Preusche, and Andreas Gerndt
Real-Time Network Streaming of Dynamic 3D Content with In-frame and Inter-frame Compression ...........................................................................................................81
Paolo Simone Gasparello, Giuseppe Marino, Filippo Bannò, Franco Tecchia, and Massimo Bergamasco
Comparing Parallel Simulation of Social Agents Using Cilk and OpenCL ......................................................88
Dominik Moser, Andreas Rüener, Kashif Zia, and Alois Ferscha
Evacuation Simulation Based on Cognitive Decision Making Model in a Socio-Technical System ......................................................98
Kashif Zia, Andreas Rüener, Alois Ferscha, and Alexei Sharanskykh
Session 8: Understanding

Some Implications of Eye Gaze Behavior and Perception for the Design of Immersive Telecommunication Systems .................................................................108
  John P. Rae, William Steptoe, and David J. Roberts
Three Frames for Studying Users in Virtual Environments: Case of Simulated Mobile Machines ........................................................................................................115
  Tarja Tiainen, Asko Ellman, and Taina Kaapu
Syncretic Post-Biological Digital Identity: Hybridizing Mixed Reality Data Transfer Systems ........................................................................................................120
  Julian Stadon and Raphael Grasset

Session 9: Balancing

Determining Optimal Update Period for Minimizing Inconsistency in Multi-server Distributed Virtual Environments .................................................................126
  Yusen Li and Wentong Cal
Investigating the Suitability of a Software Capture Trigger in a 3D Reconstruction System for Telepresence ..................................................................................134
  Carl Moore, Toby Duckworth, and David J. Roberts
Camera Image Synchronisation in Multiple Camera Real-Time 3D Reconstruction of Moving Humans ....................................................................................................138
  Tobias Duckworth and David J. Roberts

Theme 3: Military Distributed Simulation

Session 10: Keynote

Training through Distributed C2 and Simulation Systems .................................................................147
  Bharatkumar Patel

Session 11: Military Distributed Simulation

Maturing Supporting Software for C2-Simulation Interoperation .................................................................148
  J. Mark Pullen and Lisa Nicklas
A Grammar for Battle Management Language ......................................................................................155
  Ulrich Schade, Bastian Haarmann, and Michael R. Hieb
UK Experiences of Using Coalition Battle Management Language ..................................................160
  Adam Brook

Invited Talk

Operational Uses of Distributed Simulation Using BML ..............................................................................168
  Per Gustavsson

Author Index ........................................................................................................................................169