Table of Contents

Message from General Co-chairs ........................................................................... ix
Message from Program Co-chairs ........................................................................... x
Organizing Committee ............................................................................................ xi
Program Committee ............................................................................................... xii
Reviewers ................................................................................................................ xiii
Keynotes .................................................................................................................. xiv

Parallel Simulation Methods

Hierarchical Composite Synchronization ................................................................. 3
   Jason Liu and Rong Rong

Fair and Efficient Dead Reckoning-Based Update Dissemination
   for Distributed Virtual Environments ...................................................................... 13
   Zengxiang Li, Xueyan Tang, Wentong Cai, and Stephen John Turner

Multi-level Parallelism for Time- and Cost-Efficient Parallel Discrete Event
   Simulation on GPUs ................................................................................................ 23
   Georg Kunz, Daniel Schemmel, James Gross, and Klaus Wehrle

Multi-Core

Dynamically Adjusting Core Frequencies to Accelerate Time Warp Simulations
   in Many-Core Processors ....................................................................................... 35
   Ryan Child and Philip Wilsey

A New Approach to Zero-Copy Message Passing with Reversible Memory
   Allocation in Multi-core Architectures .................................................................... 44
   Brian Paul Swenson and George F. Riley
Characterizing and Understanding PDES Behavior on Tilera Architecture ........................................53
Deepak Jagtap, Ketan Bahulkar, Dmitry Ponomarev, and Nael Abu-Ghazaleh

Short Papers and Emerging Research I

HLA-Based Parallel Simulation: A Case Study ..........................................................65
Buquan Liu, Yiping Yao, Zhiwen Jiang, Laibin Yan, Qingjun Qu, and Shaoliang Peng

Discrete Event Simulation for Antisubmarine Searching ..............................................68
Jinshu Wang and Bin Xiao

Cloud-Based Simulation: The State-of-the-Art Computer Simulation Paradigm ..............71
Xiaocheng Liu, Xiaogang Qiu, Bin Chen, and Kedi Huang

SafeBTW: A Scalable Optimistic Yet Non-risky Synchronization Algorithm .......................75
Yaocheng Zhang and Ge Li

Vector Time Management Based on Topology Information for HLA/RTI .........................78
Chunpeng Chen and Hongjin Jia

A Bug Locating Method for the Debugging of Parallel Discrete Event Simulation ...............81
Feng Zhu and Yiping Yao

Research on GPU-Based Computation Method for Line-of-Sight Queries .........................84
Bin Liu, Yiping Yao, Wenjie Tang, and Yang Lu

A Simplified Belonging Tree for Optimizing Information Transmission on Large-Scale Distributed Simulations ........................................................87
Chen Liu, Jihong Cai, Kai Yang, Duzheng Qing, and Mingwen Chen

Offline Road Network Partitioning in Distributed Transportation Simulation ....................90
Xu Yan and Gary Tan

Performance Analysis of a Multithreaded PDES Simulator on Multicore Clusters .................93
Jingjing Wang, Dmitry Ponomarev, and Nael Abu-Ghazaleh

Feasibility Study on Distributed Simulations of BGP ..................................................96
David Coudert, Luc Hogie, Aurélien Lancin, Dimitri Papadimitriou, Stéphane Perennes, and Issam Tahiri

Network Simulation

Open Network Emulator: A Parallel Direct Code Execution Network Simulator ..................101
Vedavyas Duggirala and Srinidhi Varadarajan

Hybrid Simulation of Packet-Level Networks and Functional-Level Routers .......................111
Mirko Stoffers and George Riley

Realizing Large-Scale Interactive Network Simulation via Model Splitting .......................120
Nathanael Van Vorst and Jason Liu
### Interest Management and Miscellaneous

**Measuring Information Exposure Attacks on Interest Management** .............................................................. 133  
*Jianan Hao and Wentong Cai*

**Enhancement of Collaborative Interest Management Mechanism for P2P Networked Virtual Environment** ........................................................................................................... 145  
*Cheng Liu and Wentong Cai*

**An Objective-Based Approach for Semantic Validation of Emergence in Component-Based Simulation Models** ................................................................. 155  
*Claudia Szabo and Yong Meng Teo*

### Short Papers and Emerging Research II

**Knowledge-Based Simulation Experiment Data Integrative Analysis Technology** ............................................................................................................. 165  
*Song Jiao, Wei Li, Ping Ma, and Ming Yang*

**Sensing-Based Modeling and Service for Conditional Connection of EDEVS Component** ................................................................. 168  
*Yang Lu, Yiping Yao, Gang Liu, and Longchen Qi*

**A Simulation System Based on OGRE and PhysX for Flexible Aircraft Assembly** ............................................................................................................. 171  
*Dong Wang, Linxuan Zhang, Mian Wang, Tianyuan Xiao, Zhixia Hou, and Fang Zou*

**Parallel Simulation of Large-Scale Artificial Society on CPU/GPU Mixed Architecture** ............................................................................................................. 174  
*Gang Guo, Bin Chen, Xiao Gang Qiu, and Zhen Li*

**SEMSim: A Distributed Architecture for Multi-scale Traffic Simulation** ............................................................................................................. 178  
*Yadong Xu, Heiko Aydt, and Michael Lees*

**Research on a Method of Combat Simulation Creditability Evaluation Based on Event Logic Analysis** ............................................................................. 181  
*Ming Sun, Hui-xian Tao, and Lei Zhang*

**A Two-Tier Parallel Architecture for Artificial Society Simulation** ............................................................................................................. 184  
*Bin Chen and Gang Guo*

**A Latency-Hiding Algorithm for ABMS on Parallel/Distributed Computing Environment** ............................................................................................................. 187  
*Li-li Chen, Jian-xin Huang, and Jing Zhang*

**A Radio-Driven Time Synchronization Protocol in Hybrid Simulation Systems** ............................................................................................................. 190  
*Zhiyu Huang*
Research on Quality-Based Data Creditability Evaluating Method in Complex Systems Simulation .......................................................... 193
Ying-chao Zhang, Jing Zhang, Wei Li, and Feng Ye

Data-Driven 4D Visualization for Simulating Highway Construction Processes ................................................................. 196
Guojun Chen, Yan Liu, Jingxiang Chen, and Wei Wu

Parallel Simulation
Virtual Time Integration of Emulation and Parallel Simulation .......................................................... 201
Dong Jin, Yuhao Zheng, Huaiyu Zhu, David M. Nicol, and Lenhard Winterrowd

Towards Symmetric Multi-threaded Optimistic Simulation Kernels .......................................................... 211
Roberto Vitali, Alessandro Pellegrini, and Francesco Quaglia

Partitioning on Dynamic Behavior for Parallel Discrete Event Simulation .......................................................... 221
Ketan Bahulkar, Jingjing Wang, Nael Abu-Ghazaleh, and Dmitry Ponomarev

Miscellaneous
A New Opportunity to Urban Evacuation Analysis: Very Large Scale Simulations of Social Agent Systems in Repast HPC .......................................................... 233
Kashif Zia, Andreas Riener, Katayoun Farrahi, and Alois Ferscha

Exploiting Sensor Spatial Correlation for Dynamic Data Driven Simulation of Wildfire .......................................................... 243
Haidong Xue and Xiaolin Hu

Verifying Dynamic Semantic Composability of BOM-Based Composed Models Using Colored Petri Nets .......................................................... 250
Imran Mahmood, Rassul Ayani, Vladimir Vlassov, and Farshad Moradi

Author Index .......................................................................................................................................................... 258