

Advanced Simulation Technologies Conference 2004

**April 18-22, 2004
Hyatt Regency, Crystal City
Arlington Virginia, USA**



Conference Symposia

- **Business and Industry Symposium**
- **37th Annual Simulation Symposium**
- **High Performance Computing Symposium**
- **Applied Telecommunication Symposium**
- **Military, Government, and Aerospace Simulation Symposium**
- **Design, Analysis, and Simulation of Distributed Systems Symposium**



Sponsored by The Society for Modeling
and Simulation International
www.scs.org

Message From The General Chair



Welcome to the 2004 Advanced Simulation Technologies Conference (ASTC'04), sponsored by The Society for Modeling and Simulation International (SCS). The ASTC'04 brings together six symposia and provides a forum for academia, industry, business, and government covering a wide variety of disciplines and domains that utilize modeling and simulation to present their work in a unique setting. ASTC'04 is truly a multi-conference whose success is brought about by the outstanding efforts of the symposia chairs. ASTC'04 is co-located with the Simulation Interoperability Standards Organization's (SISO) Spring Simulation Interoperability Workshop (SIW) to provide an even more diverse and valuable experience.

The ASTC'04 program includes not only a wide selection of technical presentations, but also distinguished speakers and insightful tutorials. The collection of papers in this conference contains

many excellent contributions from our colleagues in academia, government, and industry whose continuing efforts of exploring new and more effective ways, writing manuscripts, and preparing presentations are easily overlooked. Our special thanks go to them because without their work, this conference would not exist.

ASTC'04 has been fortunate to have several new faces on the Conference Committee who have really made a difference. Mike Chinni, SCS Associate Vice President for Web Operations, has done an outstanding job of publicizing this conference. Larry Deschaine has revitalized our tutorial program and Levent Yilmaz has increased the number of exhibitors at ASTC'04. Special thanks to Mohammad Obaidat, SCS Vice President for Conferences, who has been very supportive of all of our efforts at ASTC'04; to Rick Sharp, the Conference Committee Chair of SISO who has been a pleasure to work with on this conference; and to Wayne Ingalls, who volunteers to put our CDs together. Special thanks are also due to the staff of SCS for their fine support and excellent cooperation in making this conference a reality. ASTC'04 would not have been possible without the hard and diligent work of the Symposium chairs and their respective organizing committees. Our special thanks are extended to the following Symposia Chairmen:

Dr. Joerg Meyer	High Performance Computing Symposium
Dr. Maurice Ades	Business and Industry Simulation Symposium
Col. Kevin Greaney	Military, Government & Aerospace Simulation Symposium
Dr. Bohdan Bodnar	Applied Telecommunication Symposium
Dr. Herwig Unger	Design, Analysis, & Simulation of Distributed Systems Symposium
Dr. Taieb Znati	37th Annual Simulation Symposium

Let me say a word about ASTC'05 next Spring in San Diego. We will expand from six symposia to nine. Bernie Zeigler will chair the DEVS World Symposium (DWS), Levent Yilmaz will chair the Agent-Based Simulation Symposium (ABS), and we will plan for an Object-Oriented Modeling Symposium (OOM). We will again co-locate with SISO's Spring Interoperability Workshop, so we can expect even more successful symposia next year. But we need YOUR help. If you are interested in becoming active in the planning and organization of ASTC'05, please make a point to see me while we are here in Washington. On behalf of the ASTC'04 Conference Committee and the Society for Modeling and Simulation International, we invite you all to enjoy the conference.

Drew Hamilton
ASTC'04 General Chair
Secretary, SCS

Information & Meetings

The Advanced Simulation Technologies Conference (ASTC) is an annual spring conference sponsored by The Society for Modeling and Simulation International. The conference covers the state of the art in simulation technologies and applications. Technologies covered include high-performance computing technologies, models and algorithms, GUI's visualization technologies, and communications. Application disciplines covered include leading-edge high technologies such as telecommunication and computer systems; military, government, and aerospace; and energy and industry. The conference includes keynote presentations by technology and industry leaders, technical sessions, professional development courses, and seminars, as well as vendor exhibits. Simulation users, developers, innovators, managers, business leaders, scientists, engineers, and operators are invited to participate.

Registration

The conference registration/information desk is open during the following hours:

Sunday	April 18	12:00pm–6:00pm
Monday	April 19	7:00am–5:00pm
Tuesday	April 20	7:00am–5:00pm
Wednesday	April 21	7:00am–3:00pm

Speaker's Breakfast

Breakfast is served for each speaker on the morning of his/her presentation. Presenters meet with Track/Session Chairs to discuss presentations of the day. Admittance with breakfast ticket only.

Monday	April 19	Tidewater	7:00am–8:00am
Tuesday	April 20	Tidewater	7:00am–8:00am
Wednesday	April 21	Tidewater	7:00am–8:00am

General Session & Keynote Speech

Monday April 19 8:30am–10:00am

Room: Regency Ballroom

François Cellier, Professor at the Department of Electrical & Computer Engineering, University of Arizona, USA

Smart Product Modeling: Dealing with the Issues of System Complexity

Coffee Breaks

Refreshments will be served in the Exhibit Area at mid-morning and mid-afternoon session breaks according to the following schedule:

Monday	April 19	Exhibit Hall B	10:00am, 3:00pm (10:00am in Regency Ballroom Foyer)
Tuesday	April 21	Exhibit Hall B	10:00am, 3:00pm
Wednesday	April 22	Exhibit Hall B	10:00am, 3:00pm

Exhibition Area

The Exhibit area will be open following the SISO General Session according to the following schedule:

Monday	April 19	Exhibit Hall B	3:00pm–8:00pm
Tuesday	April 20	Exhibit Hall B	10:00am–5:00pm
Wednesday	April 21	Exhibit Hall B	10:00am–2:00pm

Exhibitor Reception

Monday April 19 Exhibit Hall B 5:00pm–8:00pm

Information & Meetings (continued)

Sunday, April 18, 2004

ASTC 2004 Registration Begins	Pillar Wall, 2:00pm-6:00pm
ASTC 2004 Pre-Conference Meeting	Boardroom, 3:00pm-5:00pm

Monday, April 19, 2004

ASTC'04 Speaker's Breakfast	Tidewater, 7:00am-8:00am
Opening Session—Keynote Speech	Regency Ballroom, 8:30am-10:00am
ATS 2005 Organizing Meeting	Chesapeake Grill, 12:00pm-1:30pm
ANSS 2005 Organizing Meeting	Chesapeake Grill, 12:00pm-1:30pm
Exhibitor Reception	Exhibit Hall B, 5:00pm-7:30pm

Tuesday, April 20, 2004

ASTC'04 Speaker's Breakfast	Tidewater, 7:00am-8:00am
SCS Conference Board Meeting	Boardroom, 10:30am-12:00pm
HPC 2005 Organizing Meeting	Chesapeake Grill, 12:00pm-1:30pm
DASD 2005 Organizing Meeting	Chesapeake Grill, 12:00pm-1:30pm
SCS Senior VP Meeting	Boardroom, 3:30pm-5:00pm

Wednesday, April 21, 2004

ASTC'04 Speaker's Breakfast.	Tidewater, 7:00am-8:00am
ASTC'05 Planning Committee	Boardroom, 8:30am-10:00am
SCS Treasurer Meeting	Boardroom, 10:30am-12:00pm
Bus. & Industry 2005 Org. Meeting	Chesapeake Grill, 12:00pm-1:30pm
MGA'05 Organizing Meeting	Chesapeake Grill, 12:00pm-1:30pm

Thursday, April 22, 2004

SCS Executive Committee	Boardroom, 8:30am-12:00pm
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ASTC 2004 Exhibitors

Booth#:	Exhibitor:
14	AEgis Technologies Group, Inc.
07	Boston Dynamics
03	CAE
06	MAK Technologies
04	NAVMSMO
08	Phoenix Integration, Inc.
13	PITCH AB
12	RAM Laboratories, Inc.
15	TERNION Corporation
01	Terrain Experts, Inc. -- TERREX
09	US Army Space and Missile Defense Battle Lab
10	US Army Virtual Targets Center
11	Virtual Technology Corporation

Special Sessions

Combined SISO/SCS Sessions

SISO/SCS M&S Standards Priorities

Monday 10:30-12:00pm, Regency Ballroom

Chair: Steve Swenson, Defense Modeling and Simulation Office, USA

Panel Discussion

This panel discussion is being held at various M&S conferences (e.g., SISO, SCS, ITEC, I/ITEC). Each session features a distinguished panel of experts from government, industry, and academia, who discuss mid-term modeling and simulation standards needs. The panel discussion will be followed by audience discussion and feedback. Results from each of these sessions will be compiled and briefed back to SISO and to key leaders in government, industry and academia.

SISO/SCS Reception & Social

Monday 5:00-8:00pm, Exhibit Hall B

Immediately following the SISO Plenary Session, a joint SISO/SCS Reception and Social will commence in the areas adjacent to the Exhibitors Area in Exhibit Hall "B." Please join us for this informal gathering! Food and drink will be available, courtesy of our our sponsors and exhibitors. Renew acquaintances, plan your week, meet SISO and SCS committee members, and take a first look at the products and technology on display.

SISO/SCS Simulation Composability

Monday 7:00pm-9:00pm, Regency Ballroom

**Paul K. Davis, Ph.D., Senior Scientist and Research Leader,
RAND Professor, RAND Graduate School, USA**

The idea of "composing" models from components has been much discussed for many years, but results to date have typically been disappointing. A recent monograph on this subject was sponsored by the Defense Modeling and Simulation Office. Written by Paul Davis and Paul Anderson of RAND's National Defense Research Institute, this document presents an independent review of the issues involved in model composability, focusing largely on DoD applications. It includes diagnosis of why model composability is so difficult (especially "substantive" composability) and suggests a systematic approach for improving prospects. In doing so, however, it urges the Department of Defense to be more realistic in its images and expectations, to back away from excessive promises, and to recognize that substantive model composability is a substantially greater challenge than merely "connecting" models. Success will require advances in related science, technology, education, and management. Paul Davis will present a summary of the findings and recommendations. This will be followed by an interactive discussion. Further discussions will be held as part of the Synthetic Mission Spaces Composability (SCS-COMPOSE) Forum on Wednesday.

Special Sessions

ASTC Tutorials:

The tutorials are open to the registered attendees of the multi-conference. Pre-registration through the SCS office is preferred as the class size is limited and they fill up fast. The short tutorials are free to paid conference attendees. The day-long Sunday tutorial on global optimization has a nominal charge of \$150 (\$125 for early registration) to defray the cost of the class materials.

Global Optimization: Engineering and Scientific Applications Sunday, April 18, 2004 10:00am–5:00pm

Room: Roosevelt Cost: \$150

Speaker: János D. Pintér, PCS Inc. & Dalhousie University, Canada

Global optimization (GO) is aimed at finding the “absolutely best” solution in nonlinear system models that (may) have a multitude of local optima. Finding the global solution requires non-traditional, global scope search algorithms and corresponding software implementations. In this talk, we review the state-of-art in global optimization, followed by illustrative engineering and scientific applications. The presentation material is based on a review of recent and ongoing work by leading GO researchers, including some of our joint projects with several research groups. Specifically, we will highlight models and case studies from the following areas: “black box” systems analysis and design, chemical and process engineering, data classification, experimental design, nonlinear regression, object-packing problems, robotics, sonar transducer design, structural engineering, and wastewater treatment systems engineering. Within this context, we will also briefly discuss the usage of nonlinear optimization software across several development platforms: programming languages, modeling languages, and scientific/technical computing platforms.

ASTC’04 Evening Tutorial Series (no fee):

1. Data Mining Techniques (Sunday, Monday, and Tuesday)

Speaker: Mikhail Golovnya, Senior Statistician, Salford Systems, USA

Data Mining together with Simulation is far more powerful than using Simulation alone. In this tutorial series, you will learn how to use a variety of the latest Data Mining tools to improve upon your existing Simulation Models. You will learn how to quickly and easily discover patterns and relationships in your data that you never knew existed. You will learn how to create models in minutes that previously may have taken you days or weeks. You will be given free access to three advanced Data Mining programs for 30 days. At the end of each of these seminars, you will have access to the software as well as the understanding to be able to try out these tools on your own data.

1a. Data Mining with Decision Trees

Sunday, April 18, 2004 7:00pm–9:00pm Room: Roosevelt

Discover the power of tree-structured data mining during this popular introductory seminar, geared toward audiences who are interested in understanding the conceptual basis of decision tree technology—what it is, why it works, how it has been used, and how it can help you make better business and/or research decisions. Explore the practical use and application of decision trees for solving real-world data mining problems.

1b. Predictive Modeling with Automated Non-linear Regression Tools

Monday, April 19, 2004 7:00pm–9:00pm Room: Potomac 2

MARS automates the development and deployment of accurate and easy-to-understand regression models. Conventional regression models typically fit straight lines to data. Although this usually oversimplifies the data structure, the approximation is sometimes good enough for practical purposes. However, in the frequent situations in which a straight line is inappropriate, an expert modeler must search tediously for transformations to find the right curve. MARS can quickly trace out any pattern detected in the data. Topics covered include: What is MARS? Why does it work? How can it be used? How can it help you develop more accurate regression models?

1c. Advanced Data Mining Techniques

Tuesday, April 20, 2004 7:00pm–9:00pm Room: Potomac 2

Learn how to use Data Mining software recently developed at Stanford University and Berkeley by world-renowned statisticians Leo Breiman and Jerome Friedman. You will learn how to use TreeNet/MART and Random Forests. Topics also include: hybridizing data mining tools, understanding what advanced features to look for in data mining software and how to use these advanced features.

ASTC Tutorials (continued)/ Plenary Speakers

3. Effectively Presenting Your Work

Monday, April 19, 2004 7:00pm–9:00pm

Speaker: Terry Kades, President Strategic Feasibilities, Inc., USA
Room: Potomac 6

This tutorial will expose you to tools and techniques that will assist you to be more effective and creative in explaining the importance of your work to both technical and non-technical staff. These business analysis, planning, and communication software tools empower managers and consultants to do a better job in these strategically important areas. Effective presentations are enabled with tools that are based on proven theories learned by many managers at business schools and on the job (e.g., BCG cash cows, stars, stage-gates, NPV, performance measurement).

4. Component-based Modeling & Simulation using DEVS Framework

Wednesday, April 21, 2004 7:00pm–9:00pm

Speaker: Hessam S. Sarjoughian, Arizona State University, USA
Room: Arlington

This tutorial presents the basic principles and techniques for developing component-based simulation models from a system-theoretic worldview. We will describe the separation between models and their executions and discuss the key role the separation plays for characterizing scalable and efficient component-based dynamical systems. The Discrete Event System Specification (DEVS) approach will be presented and we will show how it supports developing modular, hierarchical simulation models. In particular, we will detail the techniques and methods for developing atomic and composite models and how combined system-theoretic and DEVS concepts support model reusability and component-based model development. The fundamental abstract simulator concepts and their role in supporting the development of sequential or parallel/distributed simulation protocols will be discussed. We will also briefly describe the verification and validation concepts and place them within the DEVS and HLA/FEDEP frameworks. To exemplify the DEVS modeling and simulation concepts, theory, and techniques, the DEVSJAVA software tool will be used. An overview of the DEVSJAVA high-level software design and its implementation will also be given.

ASTC Plenary Speakers:

1. Annual Simulation Symposium

Monday, April 19, 2004 10:30am–11:30am Potomac 4

Arnold Rosenberg, University of Massachusetts, USA

How to Share a Bag of Tasks Optimally in a Heterogeneous Cluster—Three Models, Three Answers

2. Business and Industry Simulation

Monday, April 19, 2004 10:30am–12:00pm Potomac 2

Santhanam Harit, Washington Group International, Inc., USA

Will presents an overview of the state-of-the-art practice of the operations/manufacturing modeling in the automobile industry.

János D. Pintér, PCS Inc., & Dalhousie University, Canada

Will review the state-of-the-art in global optimization, followed by illustrative engineering and scientific applications ranging from the “black box” systems analysis and design to applications such as robotics and wastewater treatment.

3. Applied Telecommunications Symposium

Monday, April 19, 2004 3:30am–5:00pm Potomac 6

Michael Caloyannides, Thomas B. Fowler, Mitretek Systems, USA

Reality Vs. Hype In Next Generation Cellular and Wireless LAN Services.

Tuesday, April 20, 2004 10:30am–12:00pm Potomac 6

Mike Johannesen, Lowenstein Sandler PC, USA

Technology and Software Patents in Focus, Or, You Mean, That Is Patentable?

Keynote Speaker

François Cellier

**Professor at the Department of
Electrical & Computer Engineering
University of Arizona, USA
Monday, April 19 8:30am–10:00am
Regency Ballroom**



Smart Product Modeling: Dealing with the Issues of System Complexity

Concepts of and ideas behind the object-oriented modeling paradigm in the context of rapid prototyping of complex physical system designs are presented. As the complexity of the systems to be simulated grows, a tool for managing the accumulated knowledge represented in the model and used in the simulation

becomes essential. It is shown that object-oriented modeling software is an essential tool in flexible manufacturing, which helps reduce both cost and time needed to manufacture customized goods using pre-fabricated components.

Dr. Cellier is a professor with the Department of Electrical and Computer Engineering at the University of Arizona. His research interests are focused on methodologies of modeling and simulation. His textbook on Continuous System Modeling (Springer-Verlag, 1991) has become one of the most widely used references in physical system modeling. His second book on Continuous System Simulation will appear in 2004, also with Springer-Verlag. Dr. Cellier has been instrumental in creating the biannual SCS series of conferences on Bond Graph Modeling and Simulation, which has become the most important forum for publishing research results related to the bond graph approach to modeling physical systems. Dr. Cellier serves currently as Senior Vice-president of SCS.

Business and Industry Symposium

GENERAL CHAIR: MAURICE J. ADES, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

PROGRAM CHAIRS: THONG HANG, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

LARRY M. DESCHAIINE, SCIENCE APPLICATIONS INTERNATIONAL CORPORATION, USA,
AND CHALMERS UNIVERSITY OF TECHNOLOGY, SWEDEN

Tutorials (refer to pages 6&7 for full descriptions):

The tutorials are open to the registered attendees of the multi-conference. The short tutorials are free to paid conference attendees. The day-long tutorial on global optimization has a nominal charge of \$150 to defray the cost of the class materials.

Sunday, 10:00am–5:00pm Room: Roosevelt

Global Optimization Workshop Algorithms, Software, and Applications

<http://www.dal.ca/~jdpinter>

Presented by: János D. Pintér, *PCS Inc.*, & *Dalhousie University, Canada*

Cost: \$150

Sunday, Monday, Tuesday, 7:00pm–9:00pm

Data Mining, presented by: Mikhail Golovnya, *Salford Systems, USA*

<http://www.salford-systems.com/>

Sunday, 7:00pm–9:00pm Room: Roosevelt

Data Mining with Decision Trees

Presented by: Mikhail Golovnya, *Salford Systems, USA*

Monday, 7:00pm–9:00pm Room: Potomac 2

Predictive Modeling with Automated Non-linear Regression Tools

Presented by: Mikhail Golovnya, *Salford Systems, USA*

Tuesday, 7:00pm–9:00pm Room: Potomac 2

Advanced Data Mining Techniques

Presented by: Mikhail Golovnya, *Salford Systems, USA*

Monday, 7:00pm–9:00pm Room: Potomac 6

Effectively Presenting Your Work

Presented by: Terry Kades, *Strategic Feasibilities, Inc., USA*

<http://www.powerstrat.com>

Tuesday, 7:00pm–9:00pm Room: Potomac 6

Building High Performance Workstation

Presented by: Ed Jamison, *Motherboard Express, USA*

<http://www.mbx.com>

Keynote Panel

Monday, April 19 Potomac 2 10:30am–12:00pm

Santhanam Harit, *Washington Group International, Inc., USA*, presents an overview of the state-of-the-art practice of the operations/manufacturing modeling in the automobile industry.

Track 1: Industrial Simulation

CHAIRS: THONG HANG, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

MAURICE J. ADES, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

Session 1: System Simulation 1

Monday Potomac 2 1:30 pm–3:00 pm

Chair: L. M. Deschaine, Science Applications International Corporation, USA

Accelerated TPM by Simulation

M. Catena, A. Persona, *University of Padova, Italy*

B. Rimini, *University of Modena and Reggio Emilia, Italy*

Possible Improving of Key Performance Indicators by the Use of Simulation
Application to Small Industrial Companies

S. Saetta, L. Tiacci, *University of Perugia, Italy*

A Macroscopic Simulation Model for the Agricultural Sector

W. J. Gehling, *Primary Industries and Resources South Australia, Australia*

Modeling Human Behavior for Simulation of Processes in Industrial Facilities

A.G. Bruzzone, R. Revetria, *University of Genoa, Italy*

M. Massei, S. Simeoni, S. Viazzo, *Liophant Simulation Club, Italy*

Session 2: System Simulation 2

Monday Potomac 2 3:30pm–5:00pm

Chair: A. G. Bruzzone, University of Genoa, Italy

Generic Simulation Models – Developmental Constraints in Manufacturing and
their Application to Material Flow Problems

S. Harit, S. Bailiff, R. Burns, Jr., *Washington Group International, USA*

Genetic Algorithms for Machine Replacement Policies

D. J. Fonseca, S. Shah, G. P. Moynihan, *University of Alabama, USA*

High Fidelity Approximation of Slow Simulators Using Machine Learning for Real-
time Simulation / Optimization

S. Regmi, *Dartmouth College, USA*

L. M. Deschaine, S. R. Regmi, *SAIC, USA*

Flexibility and Time Optimization in an Automotive Assembly Line:

A Neural Network Approach

A. Sanchez-Martinez, T. Salais-Fierro,

Corporacion Mexicana de Investigacion en Materiales S.A., Mexico

Session 3: System Simulation 3

Tuesday Potomac 2 8:30am–10:00am

Chairs: M. Adelantado,

French Aeronautics & Space Research Center, France

L. M. Deschaine, Science Applications International Corporation, USA

Modeling and Simulation of Air Traffic Management Systems:
Present and Future Issues

M. Adelantado, *French Aeronautics and Space Research Agency, France*

Mobile User Location-based Bus Service Application

A. P. Silva, G. R. Mateus, R. P. L. Xavier, *Federal University of Minas Gerais, Brazil*

Agent-based Simulation of Telecommunications Services Market in a
Metropolitan Area

V. Kyrlyov, A. Kanwal, T. Kyrlyova, *Simon Fraser University, Canada*

Models for Introduction of Mobile Technologies in External Logistics

A. G. Bruzzone, R. Revetria, R. Mosca, *University of Genoa, Italy*

Session 4: Industrial Processes**Tuesday Potomac 2 10:30am–12:00pm****Chair: J. S. Janosy, KFKI Atomic Energy Research Institute, Hungary**

The Use of Simulation in the EB-PVD Process Control for the Heat Conductivity Minimization of “Herringbone” TBCs

E. Lugscheider, R. Nickel, *Aachen University, Germany*

Simulation of an Incident Happened during Fuel Assembly Cleaning at Paks NPP

J. Elter, *Paks Nuclear Power Plant Ltd., Hungary*

C. Gyori, J. S. Janosy, I. Toth, *KFKI Atomic Energy Research Institute, Hungary*

A Framework for Integrating 2-D and 3-D Modeling to Simulate the Grinding and Polishing of Glass Lens Blanks

J. Sanders, S. Udoka, *North Carolina Agricultural and Technical State University, USA*

Computer-aided Flow-shop Sequencing with Sequence Dependent Set-up Times and Due-Dates

P. Chandna, S. K. Sharma, *N. I. T. Kurukshetra, India*

Session 5: Environmental Technology 1**Tuesday Potomac 2 1:30pm–3:00pm****Chair: L. B. Collard, Westinghouse Savannah River Company, USA**

A Formal Dynamic Algorithm with Temporal Feedback to Optimize the Long-Term Monitoring of Monitored Natural Attenuation and Technical Impracticable Projects

L. M. Deschaine, *SAIC, USA*

Y. Zhang, *BNL, USA;*

P. A. Nordin, *Chalmers University of Technology, Sweden*

The Importance of CMMI/DSMO in Subsurface Simulation

B. A. Baker, L. M. Deschaine, S. R. Regmi, *SAIC, USA*

M. J. Ades, *Westinghouse Savannah River Company, USA*

Soil Erosion and Deposition Modeling using ArcGIS™

J. J. Consort, M. H. Zaluski, S. B. Antonioli, *MSE Technology Applications, USA*

Session 6: Environmental Technology 2**Tuesday Potomac 2 3:30pm–5:00pm****Chair: T. Hang, Westinghouse Savannah River Company, USA**

Comparison of Performance of Underground Vaults and Trenches for Disposal of Radioactive Waste

L. B. Collard, *Westinghouse Savannah River Company, USA*

A Simple Model for Tracking “Decay Series” in Ground Water and Other Media

P. A. Rzepecki, *STS Consultants, Ltd., USA*

A Dynamic Model of the Actinide Removal Process at the Savannah River Site

T. Hang, *Westinghouse Savannah River Company, USA*

Session 7: Project Management**Wednesday Potomac 2 8:30am–10:00am****Chair: L. A. Riley, New Mexico State University, USA**

U-Shaped Assembly Lines with Stochastic Tasks Execution Times: Heuristic Procedures for Balancing and Re-balancing Problems

R. Gamberini, A. Grassi, *University of Modena and Reggio Emilia, Italy*

M. Gamberi, R. Manzini, A. Regattieri, *University of Bologna, Italy*

Application of Simulation in a Small Paper-Making Company

S. Saetta, L. Tiacci, *University of Perugia, Italy*

HB-Line Neptunium Campaign: Model-Based Project Management

R. C. Chang, *Westinghouse Savannah River Company, USA*

Session 8: Optimization/Decision Analysis

Wednesday Potomac 2 10:30am–12:00pm

Chair: L. A. Riley, New Mexico State University, USA

A New Paradigm for Optimizing Hybrid Simulations of Rare Event Modeling for Complex Systems

P. Bandini, J. Cook, M. C. Mitchell, L. A. Riley, *New Mexico State University, USA*

Getting It Right at the Very Start – Building Project Models Where Data Is Expensive by Combining Human Expertise, Machine Learning and Information Theory

F. D. Francone, *RML Technologies, Inc., USA*

L. M. Deschaine, *SAIC, USA*

Intelligent Decision Making Using Real-Time Simulations of Continuous Processes

M. Dalal, B. Groel, A. Prieditis, *LookAhead Decisions, Inc., USA*

Session 9: Mathematical Models 1 :

Simulation Methodology

Wednesday Potomac 2 1:30 pm–3:00pm

Chair: M. J. Ades, Westinghouse Savannah River Company, USA

Types of Software Systems and Structural Features of Programming and Simulation Languages

M. S. Burgin, P. Eggert, *UCLA, USA*

Individual, Group, and Interactive Optimization in a Form of Genetic Algorithms

M. J. Ades, *Westinghouse Savannah River Company, USA*

M. S. Burgin, *UCLA, USA*

L. M. Deschaine, *SAIC, USA*

Proxy-Bidding Strategies for Intelligent Agent Negotiations

H. Attri, F. F. Chen, A. Goel, S. C. Sarin, *Virginia Polytechnic Institute & State University, USA*

Optimization Calculus

M. S. Burgin, *UCLA, USA*

Track 2: International Industrial Simulation

CHAIR: MAURICE J. ADES, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

Session 1: International Industrial Simulation Round Table Discussion

Wednesday Potomac 2 3:30 pm–5:00pm

Chairs: M. J. Ades, Westinghouse Savannah River Company, USA

L. M. Deschaine, Science Applications International Corporation, USA

Topic: Overview and Status of Simulation in the World and Applications

Design, Analysis, and Simulation of Distributed Systems

CHAIR: HERWIG UNGER, UNIVERSITY OF ROSTOCK, GERMANY

PROGRAM CO-CHAIRS: DIETMAR TUTSCH, TECHNICAL UNIVERSITY OF BERLIN, GERMANY

PROGRAM CO-CHAIR: PETER KROPF, UNIVERSITY OF MONTREAL, CANADA

Session 1: System Analysis

Monday Potomac 1 1:30pm–3:00pm

Chair: Peter Kropf, University of Montreal, Canada

Approximate Performance Analysis of Resource Sharing Systems Using Stochastic Petri Nets

Zhangxi Tan, Chuang Lin, *Tsinghua University, China*

Quantitative Analysis of Dynamic Reconfiguration Algorithms

Jamie J Hillman, Ian Warren, *Lancaster University, United Kingdom*

Transmitter Buffer Behavior of the Stop-and-Wait ARQ Scheme Under Correlated Errors

Krzysztof Tworus, Stijn De Vuyst, Sabine Wittevrongel, Herwig Bruneel, *Ghent University, Belgium*

Session 2: Modeling and Simulation 1

Monday Potomac 1 3:30pm–5:00pm

Chair: Herwig Unger, University of Rostock, Germany

Multicast Routing in Clos Networks

Dietmar Tutsch, Günter Hommel, *Technische Universität Berlin, Germany*

Interest Management in Distributed Simulation: A Survey

Bora I. Kumova, *University of Birmingham, United Kingdom*

Sandesh- A New Paradigm for Modelling Dynamic Systems

Suman Ram Karumuri, *Vasavi College of Engineering, India*

Session 3: Modeling and Simulation 2

Tuesday Potomac 1 8:30am–10:00am

Chair: Bora I. Kumova, University of Birmingham, United Kingdom

A Simulator for Scheduling and Execution of Parallel Jobs in a Metacomputing Environment

Judhi Santoso, *Bandung Institute of Technology, Indonesia*

Towards Configurable and Adaptable Distributed Event Dispatching

Michela Becchi, *IBM Boeblingen Lab, Germany*

Modeling and Verification of Real-Time Mediation Systems

Li Yang, Raimund K Ege, *FIU, USA*

Session 4: Innovative Concepts

Tuesday Potomac 1 10:30am–12:00pm

Chair: Krzysztof Tworus, Ghent University, Belgium

Multi Container Loading with Grouping Goals: an Agent-Based Approach

Pawel J Kalczyński, *University of Toledo, USA*

Leszek Dabrowski, *Art Series, Ltd., Poland*

An Empirical Assessment of Distributed Object Architectures

Sanjay P. Ahuja, Jayant Mishra, *University of North Florida, USA*

A Viewpoints Approach to Designing Group Based Applications

D. H. Akehurst, J. Derrick, A. G. Waters, *University of Kent, United Kingdom*

Session 5: P2P Systems 1

Tuesday Potomac 1 1:30pm–3:00pm

Chair: Lennart Esbjörn Isaksson, Blekinge Institute of Technology, Sweden

New Efficient Replacement Strategies for P2P Cooperative Proxy Cache Systems

James Z. Wang, Ankur Pal, Pradip K. Srimani, *Clemson University, USA*

Improved Lookup Algorithms in Viceroy, A Peer-To-Peer System

Oren Dobzinski, Anat Talmy, *Hebrew University of Jerusalem, Israel*

Design and Implementation of Distributed DEVS Simulation in a Peer to Peer Network System

Saehoon Cheon, Seo Chungman, Sunwoo Park, Bernard P Zeigler, *University of Arizona, USA*

April 18–April 22, 2003

Session 6: P2P Systems 2

Tuesday Potomac 1 3:30pm–5:00pm

Chair: Oren Dobzinski, Hebrew University of Jerusalem, Israel

Measurement Study of Shared Content and User Request Structure in Peer-to-Peer Gnutella Network

Herwig Unger, German Sakarian, Przemyslaw Makosiej, *University of Rostock, Germany*

Contract-Based Workflow Paradigm For Mobile E-Commerce

V. K. Murthy, *University of New South Wales, Australia*

Session 7: Networks

Wednesday Potomac 1 8:30am–10:00am

Chair: Peter Kropf, University of Montreal, Canada

Reliability and Efficiency of Messaging Mechanism in Web Services

Linhua Li, Gang Zhou, Shilong Ma, *BeiHang University, China*

Process Composition of Web Services with Complex Conversation

Protocols: a Colored Petri Nets Based Approach

Xiaochuan Yi, Krzysztof J. Kochut, *University of Georgia, USA*

Modular Compositional Validation of Protocol Conflicts for Network Interoperability

Levent Yilmaz, John A. Hamilton, *Auburn University, USA*

Validation of Simulations of Bluetooth's Frequency Hopping Spread Spectrum Technique

Lennart Esbjörn Isaksson, Markus Fiedler, Arne A. Nilsson,

Blekinge Institute of Technology, Sweden

Session 8: Algorithms

Wednesday Potomac 1 10:30am–12:00pm

Chair: Herwig Unger, University of Rostock, Germany

A Distributed Spanning Tree Algorithm for Topology-Aware Networks

Nicolae N. Goga, Mooij J. Arjan, Wesselink W. Wieger,

Technical University Eindhoven, Netherlands

Box Calculus with High-Level Buffers

Cécile Bui Thanh, Franck Pommereau, *University of Paris, France*

Hanna Kludel, *Université Evry-Val d'Essonne, France*

Application of Mobile Agents in Mobile Heterogeneous Database Environment

Performance and Power Consumption Analysis

Yu Jiao, Ali R. Hurson, *Pennsylvania State University, USA*

Session 9: Petri Nets

Wednesday Potomac 1 1:30pm–3:00pm

Chair: Dietmar Tutsch, Technical University of Berlin, Germany

Synthesis of Petri Nets from Message Sequence Charts Specifications for Protocol Design

Marco Sgroi, Alberto Sangiovanni-Vincentelli, *University of California, Berkeley, USA*

Alex Kondratyev, Yosinori Watanabe, *Cadence Design Systems, USA*

Luciano Lavagno, *Politecnico di Torino, Italy*

Pre-Runtime Scheduling for Embedded Hard Real-Time Systems Using Time Petri Nets

Raimundo Barreto, Paulo Maciel, *UFPE, Brazil*

Modeling a Processor with a Petri Net Extension for Digital Systems

Wagner Luiz Alves Oliveira, Furio Damiani, *IBILCE/UNESP, DCCE, Brazil*

Norian Marranghello, *Unicamp, Brazil*

Military, Government, and Aerospace Simulation

CHAIR: KEVIN J. GREANEY, MISSILE DEFENSE AGENCY, USA

Combined Session with SISO

Monday Potomac 5 10:30am–12:00pm

SISO Keynote

Monday Potomac 5 1:30pm–3:00pm

SISO Keynote

Monday Potomac 5 3:30pm–5:00pm

Session 1: Command and Control

Tuesday Potomac 5 8:30am–10:00am

Chair: Kevin J. Greaney, Missile Defense Agency, USA

A Framework for Comparing Command and Control Architectures for Autonomous Tactical Missile Swarms

John M. D. Hill, John James, Fernando Maymi, *US Military Academy, USA*

Modeling and Simulation Implications of the “Power to the Edge” Vision

Jeffery W. Wilson, *United States Department of Defense, USA*

Modeling Bilateral Interoperability Through Command and Control Architecture

John A. Hamilton, Levent Yilmaz, *Auburn University, USA*

Session 2: Defense Applications

Tuesday Potomac 5 10:30am–12:00pm

Chair: John Hamilton, Auburn University, USA

BMC2 Test Driver Using a JRE Data Link

James Weiner, Mark Thompson, *Raytheon, USA*

John Shrontz, *Northrop Grumman Mission Systems, USA*

Cora LaFontant, *US Army Space and Missile Defense Command, USA*

Generalized Representation of Space-based Platforms for Various Orbit Types

Kevin Crumlish, Perry Feuerstein, Matthew Gorevin, Frank Grose, Sam McNully, *SAIC, USA; Space & Missile Defense Command, USA; CG2, USA*

Riverine Operations: Modeling and Simulation

Roberto B. Seixas, *PUC-Rio, Tecgraf and IMPA, Visgraf, Brazil*

Gustavo Henrique O. Lyrio, *IMPA, Visgraf, Brazil*

Session 3: Modeling

Tuesday Potomac 5 1:30pm–3:00pm

Chair: Mike Chinni, Picatinny Arsenal, USA

Cooperative Agent-based Software Architecture for Distributed Simulation

V. K. Murthy, *University of New South Wales, Australia*

Developing Human Performance Models Using Apex / CPM-GOMS for Agent-Based Modeling and Simulation

Seung Man Lee, Roger Remington, Ujwala Ravinder, Michael Matessa, *NASA Ames Research Center, USA*

Developing Threat Scenarios and Strategy Models with Computer Aided Morphological Analysis

Thomas P. Ritchey, *Swedish Defence Research Center, Sweden*

Back From the Future: Using Projected Futures from Recursive Simulation to Aid Decision making in the Present

Ravikant Agarwal, John B. Gilmer, *Wilkes University, USA*

Session 4 Applied Simulation

Tuesday Potomac 5 3:30pm–5:00pm

Chair: John Hill, US Military Academy, USA

Model-Based Swarm Control of Unmanned Ground Vehicles

Armand E Prieditis, Mukesh Dalal, Andrew Arcilla, Brett Groel, Michael Van Der Bock, Richard Kong, *LDI, USA*

A Simulation Method for Probabalistic Risk Assessment

Jason L. Overstreet, Yannie L. Yu, *United Space Alliance, USA*

The Intelligent Power Plant Analysis Tool

W. Robert J. Harrison, Christopher M. Wren, John M. D. Hill,
US Military Academy, West Point, USA

A Self-Organizing Fuzzy Decoupling Control Approach for Nonlinear Systems

Li Zhan, *Beijing Infomation Technology Institute and Beijing Institute of Technology, China*

Session 5 Body of Knowledge 1

Wednesday Potomac 5 8:30am–10:00am

Chair: David Cook, AEGIS Technologies, USA

Session 6 Body of Knowledge 2

Wednesday Potomac 5 10:30am–12:00pm

Chair: Jim Skinner, AEGIS Technologies, USA

Session 7 DEVS 1

Wednesday Potomac 5 1:30pm–3:00pm

Chair: Hessam Sarjoughian, Arizona State University, USA

Design and Implementation of Distributed DEVS Simulation in a Peer to Peer Network System

Saehoon Cheon, Chungman Seo, Sunwoo Park, Bernard P Zeigler,
University of Arizona, USA

Building Simulation Modeling Environments Using Systems Theory and Software Architecture Principles

Hessam S. Sarjoughian, Ranjit K Singh, *Arizona State University, USA*

Modeling State-Based DEVS Models in CD++

Gabriel Wainer, *Carleton University, Canada*

Alejandro Dobniewski, Gastón Christen, *University of Buenos Aires, Argentina*

Session 8 DEVS 2

Wednesday Potomac 5 3:30pm–5:00pm

Chair: Gabriel Wainer, Carleton University, USA

Risk-free Optimistic Simulation of DEVS Models

James Nutaro, *University of Arizona, USA*

Modeling Complex Physical Systems Using 2D Finite Elemental Cell-DEVS

Gabriel Wainer, Hesham Saadawi, *Carleton University, Canada*

Applied Telecommunications Symposium

CHAIR: BOHDAN BODNAR, MOTOROLA, USA

Session 1: Traffic Engineering with Protocols and Devices

Monday Potomac 6 10:30am–12:00pm

Chair: Junaid Zubairi, State University of New York, USA

Co-Chair: Chia J. Liu, AT&T, USA

Observing the effect of TCP Congestion Control on Network Traffic

Yongmin Choi, John A. Silvester, *University of Southern California, USA*

Multipath Routing in an MPLS Domain

Junaid A. Zubairi, *International Islamic University, Malaysia*

Nabeel A. Al-Bahbooh, *State University of New York, USA*

Effects of Bandwidth Sharing on Optimal Complete Partitioning Policy

Leiyuan Li, Chunxiao Chigan, *Michigan Technological University, USA*

Performance Analysis of MPLS TE Queues for QoS Routing

Yihan Li, Shivendra Panwar, *Polytechnic University, USA*

Chia (Charlie) J Liu, *AT&T, USA*

Session 2: Modeling Techniques

Monday Potomac 6 1:30pm–3:00pm

Chair: Hasaan Rajaei, Bowling Green State University, USA

Co-Chair: Mohsen Guizani, University of Michigan, USA

Simplified Mathematical Modeling of Joint Multilayer Network Restoration via Sampling Technique

Chunxiao Chigan, *Michigan Technological Institute, USA,*

Gary Atkinson, Ramesh Nagarajan, *Bell Labs, USA*

The All Domain Management Entities Supervisor Entity as Model for Operations System Support

Wolfgang Haidegger, *FTW, Austria*

Performance of WAN Bottleneck Links through Simulation

Shakil Akhtar, Hashir Kidwai, *UAE University, United Arab Emirates*

Modeling Decision Making by Telecommunications Services Providers in a Strategy Market Game

Vadim Kyrlyov, Carole Bonanni, *Simon Fraser University, Canada*

Session 3: Invited Paper:

Monday Potomac 6 3:30pm–5:00pm

Reality Vs. Hype In Next Generation Cellular and Wireless LAN Services.

Michael Caloyannides, Thomas B. Fowler, *Mitretek Systems, USA*

Session 4: Wireless 1

Tuesday Potomac 6 8:30am–10:00am

Chair: Hasaan Rajaei, Bowling Green State University, USA

Co-Chair: Mohsen Guizani, University of Michigan, USA

Optimum Traffic Channel in GSM Network by Using Alternative Call Routing

Jatuporn Pliancharoen, Palapol Thaibunterng, Suthichai Noppanakeepong, *King Mongkut's Institute of Technology, Thailand*

An Experimental Analysis Study of Loss Rate in Wireless Mobile IP Systems

Mohammad S. Obaidat, *Monmouth University, USA*

Yulian Wang, *Nokia, Finland*

Modeling and Simulation of 802.11g WLAN using Matlab and Simulink

Shakil Akhtar, Mohammad Boulmalf, Amine Sobh, *UAE University, United Arab Emirates*

Session 5: Invited Paper:

Tuesday Potomac 6 10:30am–12:00pm

Technology and Software Patents in Focus, Or, You Mean, That Is Patentable?
Mike Johannesen, *Lowenstein Sandler PC, USA*

Session 6: Networks and Multimedia 1

Tuesday Potomac 6 1:30pm–3:00pm

Chair: Aftab Ahmad, Norfolk State University, USA

Enabling CDN for Live Streaming- A Server-CDN Joint Perspective
Yunfei Zhang, Changjia Chen, *Beijing Jiaotong University, China*

A Study of a Dual Round-Robin based iSLIP (DiSLIP) Scheme for IP Switching Systems
Jin Seek Choi, *Information and Communications University, Korea*

An Implementation of Optical Network Design and Evaluation Simulator for Wavelength Routed Optical Networks
Min Ho Park, Jin Seek Choi, *Information and Communications University, Korea*

Automatic Conversion from HCM to CCM in Telecommunication Service Simulation
Tadashi Ohta, Akiyo Nakashima, *SOKA University, Japan*

Session 7: Wireless 2

Tuesday Potomac 6 3:30pm–5:00pm

Chair: Hasaan Rajaei, Bowling Green State University, USA

Co-Chair: Mohsen Guizani, University of Michigan, USA

Performance Analysis of High Data Rate Wireless Cellular System with Service Priority at the Air Interface
Shusaburo Motoyama, Hugo Swart, *University of Campinas, Brazil*

Architecture Optimization of 3rd Generation Wireless Systems Based on Use Cases
Andreas Mitschele-Thiel, *Technical University of Ilmenau, Germany*
Peter Schefczik, *Lucent Technologies, Germany*
Anja Wiedemann, *University of Duisburg-Essen, Germany*

Secure Mobile Computing Environment
John J. Laskar, *Mitretek Systems, USA*

Session 8: Network Management and Security 1

Wednesday Potomac 6 8:30am–10:00am

Chair: Axel Lehmann, Universitat der Bundeswehr, Germany

Co-Chair: Wolfgang Haidegger, Siemens, FTW, Austria

Using Simulation to Analyze Denial of Service Attacks
James Wade Chatam, John Rice, John A. Hamilton, *Auburn University, USA*

On the Modeling Issue of Joint Cross-Layer Network Protection/Restoration
Chunxiao Chigan, Ramesh Nagarajan, Gary Atkinson
Michigan Technological Institute, USA; Lucent Technology, USA

Performance of SCTP-controlled Failovers in M3UA-based SIGTRAN Networks
Karl-Johan Grinnemo, *TietoEnator, Telecom & Media, Sweden*
Anna Brunstrom, *Karlstad University, Sweden*

Session 9: Network Management and Security 2**Wednesday Potomac 6 10:30am–12:00pm****Chair: Axel Lehmann, Universitat der Bundeswehr, Germany****Co-Chair: Wolfgang Haidegger, Siemens, FTW, USA**

Analytically Modeling Cyber Attacks in IP Networks

Denise M. Masi, Martin J. Fischer, David A. Garbin, James R. Soltys, *Mitretek Systems, USA*

Centralized Approach For Configuration Management Of Bridged Network

Naresh Kumar Duhan, Deepak Bagai, *Punjab Engineering College, India*

Designing A CIM-Database for End2End Performance Management in Heterogeneous Telecommunications-Networks

Wolfgang Haidegger, Nikolaus Jozefiak, Gerald Berwid, *FTW, Austria*

Availability-aware Analysis and Evaluation of Mesh and Ring Architectures for Long-haul Networks

Hakki Cankaya, Ana Lardies, Gary Ester, *Alcatel USA, USA***Session 10: Wireless 3****Wednesday Potomac 6 1:30pm–3:00pm****Chair: Hasaan Rajaei, Bowling Green State University, USA****Co-Chair: Mohsen Guizani, University of Michigan, USA**

Automatic Channel Allocation in Cellular Network

Tanom Mahantasanapong, *Chulalongkorn University, Thailand*

A Mobility Resilient Routing Protocol for MANETs

Aftab Ahmad, *Norfolk State University, USA***Session 11: Networks and Multimedia 2****Wednesday Potomac 6 3:30pm–5:00pm****Chair: Aftab Ahmad, Norkfolk State University, USA**

Modeling and Analysis of Ultra High Capacity Optical Networks

Arnold W. Bragg, *MCNC Research and Development Institute, USA*

Implementation of BGP in a Network Simulator

Tony Dongliang Feng, Rob Ballantyne, Ljiljana Trajkovic, *Simon Fraser University, Canada*

High Performance Computing Symposium (HPC'04)

Grand Challenges in Computer Simulation

CHAIR: PROF. JOERG MEYER, UNIVERSITY OF CALIFORNIA, IRVINE, USA

Keynote Address: High-Performance Visualization in Tele-Immersion Environments

Monday Potomac 3 10:30pm–12:00pm

Oliver G. Staadt, *University of California at Davis, USA*

The increasing availability of powerful graphics accelerators and data projectors allows a larger group of users to employ virtual reality systems. Tele-presence environments can further support collaboration of multiple users over the internet. In this presentation Dr. Staadt will introduce the blue-c environment and some of its core software components. The blue-c is a tele-presence environment that supports bi-directional immersive projection combined with 3D video acquisition. At each blue-c portal 16 2D video streams of the blue-c users are processed in real time to create a point-based surface representation, which can be streamed to a remote portal. A distributed scene graph, which can contain geometric primitives as well as 3D video objects, is part of the core API for the development of distributed blue-c applications.

Session 1: High Performance Computing Applications 1

Monday Potomac 3 1:30pm–3:00pm

Chair: Layne T. Watson, Virginia Tech., USA

Platform Extensions of a Distributed Simulation Kernel

Bora I. Kumova, *University of Birmingham, United Kingdom*

Accelerate Verilog Simulation on Myrinet Cluster

Lijun Li, Carl Tropper, *McGill University, Canada*

Efficient Solution of Poisson-Boltzmann Equation for Electrostatics of Large Molecules

Xuejun Hao, Amitabh Varshney, *University of Maryland at College Park, USA*

Session 2: High Performance Visualization and Web Applications

Monday Potomac 3 3:30pm–5:00pm

Chair: Oliver G. Staadt, University of California at Davis, USA

Platform Based Based Physical Response Modeling

James R Armstrong, Brian Vick, Elaine Scott Scotte, *Virginia Tech, USA*

Placement of Web Proxies with Server Capacity Constraints

Mohammad S. Obaidat, *Monmouth University, USA*

F. Tenzakhti, M. Ould-Khaoua, *Glasgow University, United Kingdom*

K. Day, *Sultan Qaboos University, Oman*

Real-Time Beam Holographic 3D Displays

Dennis Solomon, *Holoverse, Inc., USA*

Session 3: High Performance Visualization and Virtual Environments

Tuesday Potomac 3 8:30am–10:00am

Chair: Gopi Meenakshisundaram, University of California at Irvine, USA

Real-Time Visualization of Large Time-varying Molecules

Xuejun Hao, Amitabh Varshney, Sergei Sukharev

University of Maryland at College Park, USA

Sonification of Three-Dimensional Vector Fields

Eric Klein, Oliver Staadt, *University of California Davis, USA*

Interactive, Wavelet-based Segmentation Toolbox

Zhihe Zhang, Joerg Meyer, *University of California, Irvine, USA*

Session 4: High Performance Computing Applications 2
Tuesday Potomac 3 10:30am–12:00pm
Chair: Joerg Meyer, University of California at Irvine, USA

Performance Evaluation and Modeling of a Parallel Astrophysics Application

Kumar G. Mahinthakumar, Mohamed Sayeed, John Blondin,

North Carolina State University, USA

Patrick H Worley, Raphael Hix, Anthony Mezzacappa, *Oak Ridge National Lab, USA*

XBS: A Streaming Binary Serializer for High Performance Computing

Kenneth Chiu, *Indiana University, USA*

Dynamic Fracture Analysis of Adhesively Bonded Double Cantilever Beam

Dhaval P Makhecha, Rakesh K Kapania, Eric R Johnson, *Virginia Tech, USA*

Session 5: Parallel Algorithms and Architectures
Tuesday Potomac 3 1:30pm–3:00pm
Chair: Manish Parashar, Rutgers University, USA

Robust Algorithms and Software for Parallel PDE-Based Simulations

Sanjukta Bhowmick, Padma Raghavan, *Pennsylvania State University, USA*

Lois C McInnes, Boyana Norris, *Argonne National Laboratory, USA*

A Hierarchical Parallel Scheme for a Global Search Algorithm

J. He, C. A. Shaffer, L. T. Watson, J. J. Tyson, J. W. Zwolak, *Virginia Tech, USA*

M. Sosonkina, *Ames Laboratory, USA*

Computational Challenges in Control of Partial Differential Equations

Jeff Borggaard, John Burns, *Virginia Tech, USA*

Lizette Zietsman, *George Mason University, USA*

Session 6: Emerging Trends in Visual Data Analysis in DoD HPC Environments
Tuesday Potomac 3 3:30pm–5:00pm
Chair: Rhonda J. Vickery, WPAFB, Ohio, USA

Presenter: Rhonda J. Vickery, WPAFB, Ohio

This presentation includes information on a sampling of the best tools, algorithms, standards, and methods that personnel in the Programming, Environment, and Training (PET) Enabling Technologies (ET) Functional Area and various DoD Visualization Labs have found are most effective for visual analysis of large datasets. Several approaches will be outlined, with an emphasis on criteria for choosing the best methods based on network and hardware constraints. Topics will include: remote, distributed, and off-screen visualization; tips and tricks for effective visualization in an HPC environment; comparisons of commercial and open-source visualization tools; data mining needs and trends; and emerging visualization formats.

Session 7: High Performance Simulation Methods
Wednesday Potomac 3 8:30am–10:00am
Chair: Layne T. Watson, Virginia Tech., USA

A High Performance Simulation Engine for Large-Scale Cellular DEVS Models

Xiaolin Hu, Bernard P Zeigler, *University of Arizona, USA*

Implementation of Distributed high-performance DEVS Simulation Framework in the Grid Computing Environment

Chungman Seo, Sunwoo Park, Byounguk Kim, Saehoon Cheon,

Bernard P. Zeigler, *University of Arizona, USA*

Graph-theoretic Methods in Simulation Using SPARK

Edward F. Sowell, *California State University, Fullerton, USA*

Michael A. Moshier, *Chapman University, USA*

Philip Haves, *Lawrence Berkeley National Laboratory, USA*

Session 8: Cluster Computing and Metacomputing
Wednesday Potomac 3 10:30am–11:00am
Chair: Manish Parashar, Rutgers University, USA

GEMS: A Job Management System for Fault Tolerant Grid Computing

Satish Tadepalli, Cal Ribbens, Srinidhi Varadarajan, *Virginia Tech, USA*

37th Annual Simulation Symposium

CHAIR: TAIEB ZNATI, UNIVERSITY OF PITTSBURGH, USA

PROGRAM CHAIR: HELEN KARATZA, ARISTOTLE UNIVERSITY OF THESSALONIKI, GREECE

Monday 10:30am–11:30am

Keynote Address: How to Share a Bag of Tasks Optimally in a Heterogeneous Cluster—Three Models, Three Answers

Professor Arnold Rosenberg, University of Massachusetts, USA

Session 1: Network Modeling and Simulation 1

Monday Potomac 4 11:30am–12:30pm

Session Chair: Taieb Znati, University of Pittsburgh, USA

End-host Multicasting in Support of Distributed Real-time Simulation Systems

Woan Sun Chang, Robert Simon, *George Mason University, USA*

Energy Efficient Protocols for Sensing Multiple Events in Smart Dust Networks

S. Nikolettseas, I. Chatzigiannakis, H. Euthimiou, A. Kinalis, A. Antoniou, G. Mylonas, *Computer Technology Institute, Greece*

Session 2: Network Modeling and Simulation 2

Monday Potomac 4 1:30pm–3:00pm

Session Chair: Robert Simon, *George Mason University, USA*

On the Implementation and Performance of the (a,t) Protocol on Linux

Anandha Gopalan, Taieb Znati, *University of Pittsburgh, USA*

Sanjeev Dwivedi, *Georgia Institute of Technology, USA*

Bruce McDonald, *Northeastern University, USA*

A Spatial Analysis of Mobility Models: Application to Wireless Ad Hoc Network Simulation

D. Charles Engelhart, Anand Sivasubramaniam, *Pennsylvania State University, USA*

Christopher L. Barrett, Madhav V. Marathe, James P. Smith,

Los Alamos National Laboratory, USA

Monique Morin, *University of New Mexico, USA*

A New Energy Efficient and Fault-tolerant Protocol for Data Propagation in Smart Dust Networks using Varying Transmission Range

Thanasis Antoniou, Ioannis Chatzigiannakis, George Mylonas, Sotiris Nikolettseas, *Computer Technology Institute, Greece*

Azzedine Boukerche, *University of Ottawa, Canada*

Session 3: Advances in Simulation Methodology and Practices

Monday Potomac 4 3:30pm–5:30pm

Session Chair: S. Nikolettseas, *Computer Technology Institute, Greece*

Investigating Ontologies for Simulation Modeling: An Experiment with Generalized Semi-Markov Processes

John A. Miller, Gregory Baramidze, Amit P. Sheth, *University of Georgia, USA*

Paul A. Fishwick, CISE, *University of Florida, USA*

Solemn: Solaris Emulation Mode for Sparc Sulima

Bill Clarke, *Australian National University, Australia*

Integrating Metadata Tools with the Data Services Archive to Provide Web-based Management of Large-Scale Scientific Simulation Data

Victor P. Holmes, Wilbur R. Johnson, David J. Miller, *Sandia National Laboratories, USA*

Integrated System Design, Analysis and Database-Driven Simulation Model Generation

Ki-Young Jeong, David Allan, *United Technologies Research Center, USA*

Session 4: Simulation-based Performance Analysis**Tuesday Potomac 4 8:30am–10:00am****Session Chair: Helen Karatza, Aristotle University of Thessaloniki, Greece**

A Service Scheduler in a Trustworthy System

Yinong Chen, *Arizona State University, USA*

Cache Simulation Based on Runtime Instrumentation for OpenMP Applications

Jie Tao, Josef Weidendorfer, *Technische Universitat Munchen, Germany*

Accelerating Web Page Retrieval Through Object Usage Declaration

Chi-Hung Chi, Xiang Li, Hongguang Wang, *National University of Singapore, Singapore***Session 5: Network and Distributed Systems Modeling and Simulation****Tuesday Potomac 4 10:30am–12:00pm****Session Chair: Yinong Chen, Arizona State University, USA**

The Benefits of Load Sharing when Dimensioning Networks

S Lincke-Salecker, *University of Wisconsin-Parkside, USA*

A Simulation Study of An Energy Efficient Routing Protocol for Mobile Ad Hoc Networks

Xiao-Jiang Du, *Indiana University and Purdue University, USA*

PI-PD-controller for Robust and Adaptive Queue Management for Supporting TCP Congestion Control

Seungwan Ryu, Chulhyoe Cho, *Mobile Telecommunication Research Laboratory, Korea***Session 6: Web-based Modeling and Simulation****Tuesday Potomac 4 1:30pm–3:00pm****Session Chair: John A. Miller, University of Georgia**

Computational Science and Engineering On-line: An Integrated Web-based Simulation Environment for Computational Science and Engineering

Thanh N. Truong, *University of Utah, USA*

A Self-manageable Infrastructure for Supporting Web-based Simulations

Yingping Huang, Xiaorong Xiang, Gregory Madey, *University of Notre Dame, USA*

Translating Activity Cycle Diagrams to Java Programs

Wladimir L. Araujo Filho and Celso M. Hirata, *Instituto Tecnológico de Aeronautica, Brazil***Session 7: Simulation Languages, Tools, and Environments****Tuesday Potomac 4 3:30pm–5:30pm****Session Chair: Shambhu J. Upadhyaya, State University of New York at Buffalo, USA**

DAP: A Generic Platform for the Simulation of Distributed Algorithms

Ioannis Chatzigiannakis, Athanasios Kinalis, Grigorios Prasinos, Christos Zaroliagis, *University of Patras, Greece*Athanasios Poulakidas, *Research Academic Computer Technology Institute, Greece*

Object-Oriented SIMSCRIPT

Steve Rice, *University of Mississippi, USA*Ana Marjanski, Harry M. Markowitz, Stephen M. Bailey, *CACI Products Company, USA*

A C++ Pooled, Shared Memory Allocator for Simulator Development

Marc D. Ronell, *University of Massachusetts, USA*

SMS - Tool for Development and Performance Analysis of Parallel Applications

Andre L. Sandri, Ronaldo A. L. Goncalves, Joao A. Martini, *Universidade Estadual de Maringa, Brazil*

Session 8: VLSI Circuit Simulation

Wednesday Potomac 4 8:30am–10:00am

Session Chair: Philip A. Wilsey, Clifton Labs, USA

Modelling SAMIPS: A Synthesisable Asynchronous MIPS Processor

Qianyi Zhang, Georgios Theodoropoulos, *University of Birmingham, United Kingdom*

RABIT: A New Framework for Runtime Emulation and Binary Translation

Suranjan Pramanik, Shambhu J. Upadhyaya, *State University of New York at Buffalo, USA*

SENS: A Sensor, Environment and Network Simulator

Sameer Sundresh, Wooyoung Kim, Gul Agha, *University of Illinois at Urbana-Champaign, USA*

Session 9: Parallel and Distributed Simulation

Wednesday Potomac 4 10:30am–12:00pm

Session Chair: Georgios Theodoropoulos, University of Birmingham, United Kingdom

Scheduling Optimization on the Simbus Backplane

Dale E. Martin, Philip A. Wilsey, *Clifton Labs, USA*

Robert J. Hoekstra, Eric R. Keiter, Scott A. Hutchinson, Thomas V. Russo, Lon J. Waters, *Sandia National Labs, USA*

Scalability and Performance of Aggregation/ Dissagregation with Data Distribution Management in a Large Scale Distributed Simulation

Azzedine Boukerche, C. Dzemajko, *University of Ottawa, Canada*

Using the High Level Architecture to Implement Selective-Fidelity

Bradley C. Schricker, Sonia R. von der Lippe, *AT&T Government Solutions, Inc., USA*

Session 10: Network Modeling and Simulation 3

Wednesday Potomac 4 1:30pm–3:00pm

Session Chair: Azzedine Boukerche, University of Ottawa, Canada

Adaptive Energy Conservation Model Using Dynamic Caching in Wireless Devices

C. Mavromoustakis, H. Karatza, *Aristotle University of Thessaloniki, Greece*

Optimized Dissemination of Highly Anticipated Content over an Itinerary Based P2P Network

K. Zerfiridis, H. Karatza, *Aristotle University of Thessaloniki, Greece*

Modeling and Simulation of ATM Traffic Management

Antonio Marcos Alberti, *National Institute of Telecommunications, Brazil*

Mauricio Luis Bottoli, Gean Davis Breda, Leonardo de Souza Mendes, *University of Campinas, Brazil*

Session 11: Network Modeling and Simulation 4

Wednesday Potomac 4 3:30pm–5:00pm

Session Chair: Helen Karatza, Aristotle University of Thessaloniki, Greece

Markov Model Based Congestion Control for TCP

Shan Suthaharan, *University of North Carolina at Greensboro, USA*

Normalizing Traffic Pattern with Anonymity for Mission Critical Applications

Chi-Hung Chi, Dongxi Liu, Ming Li, *National University of Singapore, Singapore*

Simulation-based Approach to Study the Coexistence Issues of WCDMA and Other Cellular Networks in Adjacent Bands

Jiang Wu, Shuangchun Liang, Kai Niu, Weiling Wu

Beijing University of Posts and Telecommunications, China

MONDAY AT-A-GLANCE:

TOPIC	Design, Analysis, and Simulation of Distributed Systems	Business and Industry Symposium	High Performance Computing Symposium	37th Annual Simulation Symposium	Military, Government, and Aerospace Simulation	Applied Telecommunication Symposium
ROOM	Potomac 1	Potomac 2	Potomac 3	Potomac 4	Potomac 5	Potomac 6
ASTC'04 Keynote Speech—in Regency Ballroom						
8:30am-10:00am						
10:30am-12:00pm	SCS-SISO Combined in Regency Ballroom	Keynote Panel	Keynote Address Tele-Immersion Environments	Keynote Address Network M&S 1	SCS-SISO Combined in Regency Ballroom	Traffic Engineering
1:30pm-3:00pm	System Analysis	System Simulation 1	HPC Applications 1	Network M&S 2	SISO Keynote in Regency Ballroom	Modeling Techniques
3:30pm-5:00pm	Modeling & Simulation 1	System Simulation 2	Visualization and Web Applications	Advances in Methodology Practices		Invited Speaker Reality Vs. Hype in Nextgen Cellular

TUESDAY AT-A-GLANCE:

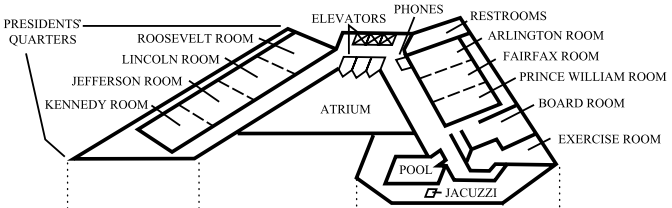
TOPIC	Design, Analysis, and Simulation of Distributed Systems	Business and Industry Symposium	High Performance Computing Symposium	37th Annual Simulation Symposium	Military, Government, and Aerospace Simulation	Applied Tele-communication Symposium
ROOM	Potomac 1	Potomac 2	Potomac 3	Potomac 4	Potomac 5	Potomac 6
8:30am-10:00am	Modeling & Simulation 2	System Simulation 3	Visualization and Virtual Environments	Sim-based Performance Analysis	Command & Control	Wireless 1
10:30am-12:00pm	Innovative Concepts	Industrial Processes	Computing Applications 2	Network & Distributed Systems M&S	Defense Applications	Technology and Software Patents
1:30pm-3:00pm	P2P Systems 1	Environmental Technology 1	Parallel Algorithms and Architectures	Web-based M&S	Modeling	Networks & Multimedia 1
3:30pm-5:00pm	P2P Systems 2	Environmental Technology 2	Emerging Trends in Visual Data Analysis	Simulation Languages Tool, Environments	Applied Simulation	Wireless 2

WEDNESDAY AT-A-GLANCE:

TOPIC	Design, Analysis, and Simulation of Distributed Systems	Business and Industry Symposium	High Performance Computing Symposium	37th Annual Simulation Symposium	Military, Government, and Aerospace Simulation	Applied Tele-communication Symposium
ROOM	Potomac 1	Potomac 2	Potomac 3	Potomac 4	Potomac 5	Potomac 6
8:30am-10:00am	Networks	Project Management	HPC Simulation Methods	VLSI Circuit Simulation	Body of Knowledge I	Network Management & Security 1
10:30am-12:00pm	Algorithms	Optimization Decision Analysis	Cluster Computing and Metacomputing	Parallel & Distributed Simulation	Body of Knowledge I	Network Management & Security 2
1:30pm-3:00pm	Petri Nets	Mathematical Models, Methodology		Network Modeling and Simulation III	DEVS I	Wireless 3
3:30pm-5:00pm		International Industrial Simulation Round Table		Network Modeling and Simulation IV	DEVS II	Networks & Multimedia 2

HOTEL MAP

THIRD FLOOR



SECOND FLOOR

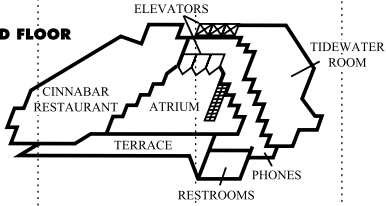
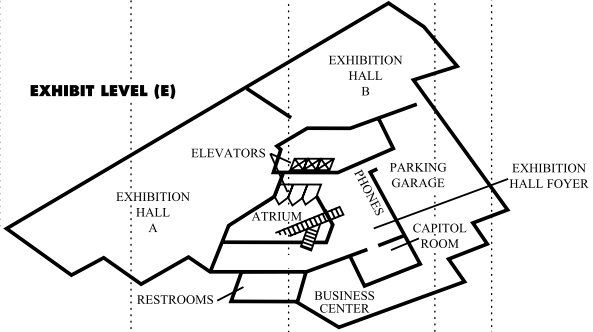
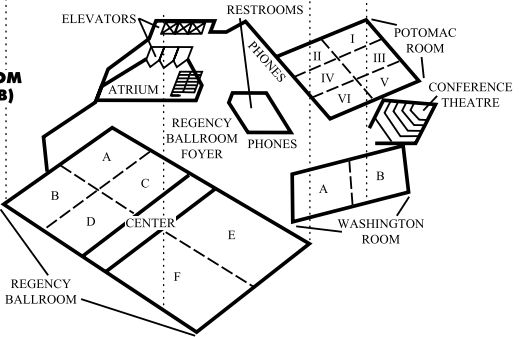


EXHIBIT LEVEL (E)



BALLROOM LEVEL (B)



♿ ALL MEETING AREAS, RESTROOMS AND PHONES ARE WHEELCHAIR ACCESSIBLE EXCEPT THE CONFERENCE THEATRE.