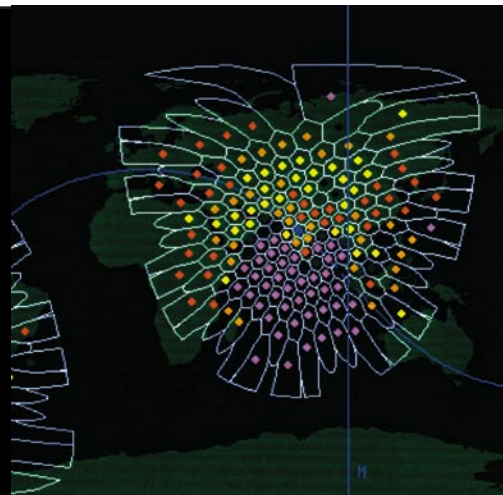
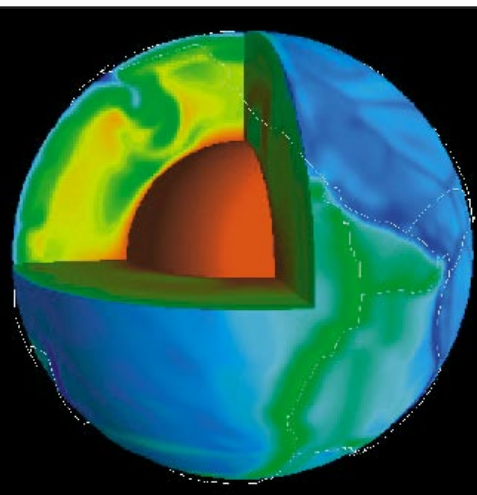


Preliminary Program for the

# Advanced Simulation Technologies Conference 2004

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



## General Chair

John A. Hamilton, Jr.  
Auburn University

## Program Chair

Maurice J. Ades  
Westinghouse Savannah River Company

## Tutorials Chair

Larry M. Deschaine,  
Science Applications International Corporation

## Publicity Chair & Webmaster

Michael J. Chinni  
U.S. ARMY - TACOM - ARDEC

## Exhibits Chair

Levent Yilmaz  
Auburn University

## Conference Symposia

- **Business and Industry Symposium**  
General Chair: Maurice J. Ades  
Westinghouse Savannah River Company, USA
- **37th Annual Simulation Symposium**  
General Chair: Taieb Znati, University of Pittsburgh
- **High-Performance Computing Symposium**  
General Chair: Joerg Meyer University of California, Irvine
- **Design, Analysis, and Simulation of Distributed Systems Symposium**  
General Chair: Herwig Unger, University of Rostock
- **Applied Telecommunication Symposium**  
General Chair: Bohdan Bodnar, Motorola, Inc.
- **Military, Government, and Aerospace Simulation Symposium**  
General Chair: Kevin Greaney, Missile Defense Agency



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AND SIMULATION INTERNATIONAL





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 David Umphress will chair the 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

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.

## Happenings of the ASTC 2004

### Sunday, April 18, 2004

**SCS Executive Committee Meeting.** Boardroom, 9:00am-10:00pm  
**ASTC 2004 Registration Begins.** Pillar Wall, 2:00pm-6:00pm  
**ASTC 2004 Pre-Conference Meeting.** Boardroom, 3:00pm-5:00pm

### Monday, April 19, 2004

**Speaker's Breakfast.** Tidewater, 7:00am-9:00am  
**Opening Session—Keynote Speech.** 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

**Speaker's Breakfast.** Tidewater, 7:00am-9:00am  
**SCS Board Meeting.** Boardroom, 10:30pm-12:00pm  
**Bus. & Industry 2005 Org. Meeting.** Chesapeake Grill, 12:00pm-1:30pm  
**MGA'05 Organizing Meeting.** Chesapeake Grill, 12:00pm-1:30pm  
**SCS Senior VP Meeting.** Boardroom, 3:30pm-5:00pm

### Wednesday, April 21, 2004

**Speaker's Breakfast.** Tidewater, 7:00am-9:00am  
**ASTC'05 Planning Committee.** Boardroom, 8:30am-10:00am  
**HPC 2005 Organizing Meeting.** Chesapeake Grill, 12:00pm-1:30pm  
**DASD 2005 Organizaing Meeting.** Chesapeake Grill, 12:00pm-1:30pm  
**SCS Treasurer Meeting.** Boardroom, 1:30pm-3:00pm

### Thursday, April 22, 2004

**ASTC'04 Wrap-up.** Boardroom, 9:00am-11:00am

## ASTC 2004 Exhibition Area

The exhibit area provides an opportunity to preview simulation hardware, software, applications, and services. Displays and vendor presentations offer visitors a chance to examine and compare these products as well as to talk informally with those who develop them. All ASTC 2004 participants are welcome to visit the exhibit area and should plan on attending the exhibitor reception Monday evening.

## Exhibit Area Hours, Exhibit Hall B

|                  |                                       |
|------------------|---------------------------------------|
| <b>Sun, 4/18</b> | 12:00pm–6:00pm (setup)                |
| <b>Mon, 4/19</b> | 3:00pm–7:30pm (reception)             |
| <b>Tue, 4/20</b> | 10:00am–5:00pm                        |
| <b>Wed, 4/21</b> | 10:00am–5:00pm                        |
| <b>Wed, 4/21</b> | 10:00am–12:00pm (tear down by 5:00pm) |

For more information about exhibiting at the ASTC 2005, contact the SCS office. Tel: 858-277-3888, E-mail: [sbranch@scs.org](mailto:sbranch@scs.org)

## 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

COST: \$150 (\$125 for early registration)

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.

### Free Tutorial Series: Data Mining Techniques

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.

### Data Mining with Decision Trees

Sunday, April 18, 2004 7:00pm–9:00pm

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.

### Predictive Modeling with Automated Non-linear Regression Tools

Monday, April 19, 2004 7:00pm–9:00pm

MARS automates the development and deployment of accurate and

## ASTC Tutorials (continued):

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?

### Advanced Data Mining Techniques

**Tuesday, April 20, 2004 7:00pm–9:00pm**

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.

### Free Tutorial: Effectively Presenting your Work

**Monday, April 19, 2004 7:00pm–9:00pm**

**Speaker: Terry Kades, President, Strategic Feasibilities, Inc., USA**

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).

### Free Tutorial: Building a High Performance Workstation

**Monday, April 19th, 2004 7:00pm–9:00pm**

**Speaker: Ed Jamison, MBX, Inc., USA**

This seminar is focused on helping the modeling and simulation community procure the right computational hardware device(s) for its work, as “mass-marketed” component selection is not always adequate for the demands of scientific computing. The attendees will learn how to specify and build their own high performance workstation. A review of the workings of a 32- or 64-bit single or multiple processor computer will be provided. A computer will be assembled from scratch as part of the course, and each step will be carefully explained. Multiple Operating System and distributed (clustered) environments will also be covered.

### Free Tutorial: Component-based Modeling & Simulation using DEVS Framework

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

**Speaker: Hessam S. Sarjoughian, Arizona State University, USA**

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:

### Annual Simulation Symposium

**Arnold Rosenberg, University of Massachusetts, USA**

**Monday, April 19, 2004 10:30am–11:30am**

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

### Business and Industry Simulation

**Keynote Panel**

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

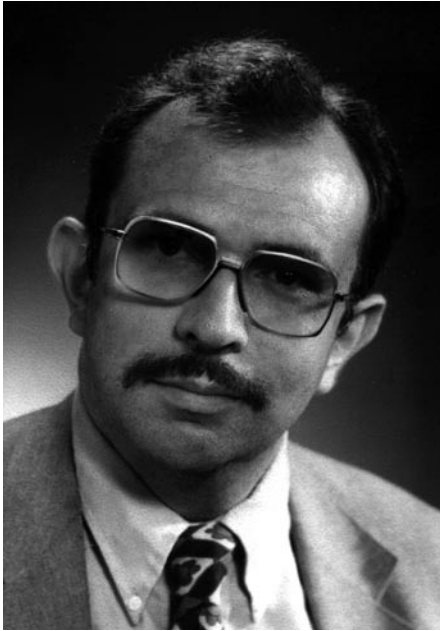
**Santhanam Harit, Washington Group International, Inc., USA**

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.

**Keynote Speaker:**



**François Cellier**

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

**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 Electrical and Computer Engineering Department of 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. DESCHAINE, SCIENCE APPLICATIONS INTERNATIONAL CORPORATION, USA, AND CHALMERS UNIVERSITY OF TECHNOLOGY, SWEDEN

### Tutorials:

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**Sunday, 10:00am–5:00 pm.**

**Global Optimization Workshop Algorithms, Software, and Applications**

**Presented by: János D. Pintér, PCS Inc., & Dalhousie University, Canada**  
<http://www.dal.ca/~jdpinter>

The objective of global optimization GO is to find the best solution in nonlinear decision models that may have a multitude of global and local optima. GO is an active research area, with a broad range of practical applications in engineering, economics, and the sciences.

We will briefly review the most important GO model types and solution approaches, and then discuss adaptive partition strategies and stochastic search methods. Both of these general approaches are globally convergent, can be implemented efficiently, and easily combine with other methods.

We continue with 'live' demonstrations of nonlinear global and convex optimization software, currently including the following products:

- LGO with a text I/O interface, with connectivity to other modeling systems
  - LGO Integrated Development Environment for MS Windows
  - Excel / LGO solver engine; we shall also review several other Excel PSP solvers
  - GAMS / LGO solver engine, with comments regarding other GAMS solvers
  - MathOptimizer for Mathematica, with comments regarding other Mathematica solvers
  - MathOptimizer Professional for Mathematica, with an external LGO link
- Further implementation work is in progress.

Modeling tips and numerical examples are also discussed during these demonstrations: the latter include a range of practical applications and case studies.

The presentation is offered in an interactive atmosphere: questions, test problems, numerical challenges, and new applications are all welcome. Participants are encouraged to send models and test problems of interest also before the workshop, possibly to include in the discussion.

Lecture notes and demo software are provided as part of the Workshop. Participants are also offered a 20% discount regarding the LGO, LGO IDE, and MathOptimizer / MathOptimizer Professional software products. The cost is \$150, and pre-registration is preferred.

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

**Data Mining**

**Presented by: Mikhail Golovnya, Salford Systems, USA**  
<http://www.salford-systems.com/>

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.

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

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**Predictive Modeling with Automated Non-linear Regression Tools**

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

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?

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**Effectively Presenting your Work**

**Presented by: Terry Kades, Strategic Feasibilities, Inc., USA**  
<http://www.powerstrat.com>

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 learnt by many managers at business schools and on the job e.g. BCG cash cows, stars, stage-gates, NPV, performance measurement.

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**Building High Performance Workstations**

**Presented by: Ed Jamison, Motherboard Express, USA**  
<http://www.mbx.com>

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### Keynote Panel

**Monday 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.**

**János D. Pintér, PCS Inc. & Dalhousie University, Canada, reviews 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. Dr. Pinter will also discuss the use of nonlinear optimization software across several development platforms: programming languages, modeling languages, and scientific and technical computing platforms.**

## Track 1: Industrial Simulation

CHAIRS: THONG HANG, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA  
MAURICE J. ADES, WESTINGHOUSE SAVANNAH RIVER COMPANY, USA

### Session 1: System Simulation I

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.

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 II

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 III

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. Kyrylov, A. Kanwal, T. Kyrylova, *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*

### Session 5: Environmental Technology I

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, *LBNL, 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 II

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*

### **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 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-CHAIR: DIETMAR TUTSCH, TECHNICAL UNIVERSITY OF BERLIN

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 I

**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 II

**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 Kalczynski, *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 I

**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

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

### Session 6: P2P Systems II

**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**

Chair: TBD

### SISO Keynote

**Monday Potomac 5 1:30pm–3:00pm**

Chair: TBD

### SISO Keynote

**Monday Potomac 5 3:30pm–5:00pm**

Chair: TBD

### Session 1: Command and Control

**Tuesday Potomac 5 8:30am–10:00am**

Chair: TBD

#### 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: TBD

#### 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: TBD

#### 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: TBD

#### 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 I

**Wednesday Potomac 5 8:30am–10:00am**

Chair: TBD

### Session 6 Body of Knowledge II

**Wednesday Potomac 5 10:30am–12:00pm**

Chair: TBD

### Session 7 DEVS I

**Wednesday Potomac 5 1:30pm–3:00pm**

Chair: TBD

#### 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 II

**Wednesday Potomac 5 1:30pm–3:00pm**

Chair: TBD

#### 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

Leyuan 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 Kyrylov, 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 Noppanakepong, *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, *Universität 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, *Universität 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, *Norfolk 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  
POTOMAC 6

#### Session 1: High Performance Computing Applications I Monday Potomac 3 10:30am–12:00pm

##### 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: Panel Discussion

Monday Potomac 3 1:30pm–3:00pm  
TBA

#### Session 3: High Performance Visualization and Web Applications

Monday Potomac 3 3:30pm–5:00pm

##### 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 4: High Performance Visualization and Virtual Environments

Tuesday Potomac 3 8:30am–10:00am

##### 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 5: High Performance Computing Applications II Tuesday Potomac 3 10:30am–12:00pm

##### 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 6: Parallel Algorithms and Architectures Tuesday Potomac 3 1:30pm–3:00pm

##### 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 7: Panel Discussion

Tuesday Potomac 3 3:30pm–5:00pm

#### Session 8: High Performance Simulation Methods

Wednesday Potomac 3 8:30am–10:00am

##### 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 9: Cluster Computing and Metacomputing Tuesday Potomac 3 10:30am–11:00am

##### 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 I

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.Chatziannakis, H.Euthimiou, A. Kinalis, A. Antoniou, G. Mylonas, *Computer Technology Institute, Greece*

### Session 2: Network Modeling and Simulation II

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 Chatziannakis, 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, East Hartford*

### 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 Synthesizable 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. Dzermajko, *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 III

**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, and Leonardo de Souza Mendes, *University of Campinas, Brazil*

## Session 11: Network Modeling and Simulation IV

**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 SESSIONS:****SCS**

| 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                            |
| <b>8:30am-10:00am</b>  | <b>ASTC'04 Keynote Speech</b>                           |                                 |                                      |                                    |  |                                      |
| <b>10:30am-12:00pm</b> | Plenary Session   | Keynote Panel                   | HPC Applications I                   | Kenote Address Network M&S 1       | SCS-SISO Combined                              | Traffic Engineering                  |
| <b>1:30pm-3:00pm</b>   | System Analysis   | Industrial Simulation           | Panel Discussion                     | Network M&S II                     | SISO Keynote                                   | Modeling Techniques                  |
| <b>3:30pm-5:00pm</b>   | Modeling & Simulation I                                 | System Simulation II            | Visualization and Web Applications   | Advances in Simulation Methodology | SISO Keynote                                   | Reality Vs. Hype in Nextgen Cellular |

**TUESDAY SESSIONS:****SCS**

| 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                           |
| <b>8:30am-10:00am</b>  | Modeling & Simulation II                                | System Simulation III           | Visualization and Virtual Environments | Sim-based Performance Analysis          | Command & Control                              | Wireless I                          |
| <b>10:30am-12:00pm</b> | Innovative Concepts                                     | Industrial Processes            | Computing Applications II              | Network & Distributed Systems M&S       | Defense Applications                           | Technology and Software Patents     |
| <b>1:30pm-3:00pm</b>   | P2P Systems I   | Environmental Technology I      | Parallel Architects and Algorithms     | Web-based M&S                           | Modeling                                       | Networks & Multimedia I             |
| <b>3:30pm-5:00pm</b>   | P2P Systems II  | Environmental Technology II     | Panel Discussion                       | Simulation Languages Tool, Environments | Applied Simulation                             | Wireless II                         |

## WEDNESDAY SESSIONS:

### SCS

| 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                           |
| <b>8:30am-10:00am</b>  | Networks  | Project Management               | Simulation Methods                   | VLSI Circuit Simulation             | Body of Knowledge I                            | Network Management & Security I     |
| <b>10:30am-12:00pm</b> | Algorithms  | Optimization Decision Analysis   | Computing and Metacomputng           | Parallel & Distributed Simulation   | Body of Knowledge I                            | Network Management & Security II    |
| <b>1:30pm-3:00pm</b>   | Petri-Nets  | Mathematical Models, Methodology |                                      | Network Modeling and Simulation III | DEVS I   | Wireless III                        |
| <b>3:30pm-5:00pm</b>   |   | International Round Table        |                                      | Network Modeling and Simulation IV  | DEVS II  | Networks & Multimedia II            |

## CONTACT INFORMATION

Name: (First, Middle, Last) \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_  
 \_\_\_\_\_ Zip: \_\_\_\_\_ Country: \_\_\_\_\_  
 This is my:  Home  Business  School (students only) Phone: ( \_\_\_\_\_ ) \_\_\_\_\_  
 Address: \_\_\_\_\_ Fax: ( \_\_\_\_\_ ) \_\_\_\_\_  
 \_\_\_\_\_ E-mail: \_\_\_\_\_  
 \_\_\_\_\_ Organization: \_\_\_\_\_  
 \_\_\_\_\_ Title/Position: \_\_\_\_\_

## DEMOGRAPHIC

Job Sector:  Government  Industry  Academia  Consultant  Other: \_\_\_\_\_  
 Job Function: \_\_\_\_\_  
 Highest Degree: \_\_\_\_\_ Year of Degree: \_\_\_\_\_  
 How many years have you been working in simulation or a related field: \_\_\_\_\_

- I do not want my address given to other SCS members with the same interest areas  
 I do not want my address information to go outside of SCS

## TECHNICAL INTERESTS

Knowing your technical interest areas assists SCS to better serve your needs. Below we have listed popular technical interest areas of SCS membership, grouped according to their relationship with SCS Technical Councils. Please choose two of six Technical Council (TC) interests and **up to five areas** you are actively interested in:

- |   |   |   |  |
|---|---|---|--|
| <p><input type="checkbox"/> <b>1. Theory &amp; Methodology</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Applied Mathematics</li> <li><input type="checkbox"/> Bond Graph Modeling</li> <li><input type="checkbox"/> Complexity</li> <li><input type="checkbox"/> Continuous Systems</li> <li><input type="checkbox"/> DEVS Methodology</li> <li><input type="checkbox"/> Discrete Systems</li> <li><input type="checkbox"/> Economics of Simulation</li> <li><input type="checkbox"/> Experimental Design</li> <li><input type="checkbox"/> Fuzzy Systems</li> <li><input type="checkbox"/> Human Factors</li> <li><input type="checkbox"/> Man-in-the-loop</li> <li><input type="checkbox"/> Operations Research</li> <li><input type="checkbox"/> Petri Nets</li> <li><input type="checkbox"/> Probability and Statistics</li> <li><input type="checkbox"/> Queuing Systems</li> <li><input type="checkbox"/> Soft Computing</li> <li><input type="checkbox"/> Standards</li> <li><input type="checkbox"/> System Dynamics</li> <li><input type="checkbox"/> Verification, Validation and Accreditation</li> </ul> | <p><input type="checkbox"/> <b>2. Tools and Technology</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Agent-based Systems</li> <li><input type="checkbox"/> Artificial Intelligence</li> <li><input type="checkbox"/> Cluster Computing</li> <li><input type="checkbox"/> Distributed Interactive Simulation</li> <li><input type="checkbox"/> Expert Systems</li> <li><input type="checkbox"/> Fossil Power Plant Simulators</li> <li><input type="checkbox"/> High Level Architecture</li> <li><input type="checkbox"/> High Performance Computing</li> <li><input type="checkbox"/> Human Behavior Representation</li> <li><input type="checkbox"/> Modelica</li> <li><input type="checkbox"/> Modeling and Simulation Environments</li> <li><input type="checkbox"/> Neural Networks</li> <li><input type="checkbox"/> Nuclear Power Plant Training Simulators</li> <li><input type="checkbox"/> Object Oriented Technology</li> <li><input type="checkbox"/> Parallel and Distributed Computing</li> <li><input type="checkbox"/> Quantitative Simulation</li> <li><input type="checkbox"/> Reconfigurable Computing</li> <li><input type="checkbox"/> Simulation Languages</li> <li><input type="checkbox"/> Simulation System Architecture</li> <li><input type="checkbox"/> Spreadsheet Modeling</li> <li><input type="checkbox"/> Synthetic Natural Environments</li> <li><input type="checkbox"/> Training Simulators</li> <li><input type="checkbox"/> Virtual Reality/Environments</li> <li><input type="checkbox"/> Visualization, Graphics and Animation</li> <li><input type="checkbox"/> Web-based Environments</li> </ul> | <p><input type="checkbox"/> <b>3. Applications in Science and Engineering</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Adaptive Systems</li> <li><input type="checkbox"/> Aerospace</li> <li><input type="checkbox"/> Air Traffic Control</li> <li><input type="checkbox"/> Automotive Systems</li> <li><input type="checkbox"/> Biomedical and Medicine</li> <li><input type="checkbox"/> CAD/CAM/CIM</li> <li><input type="checkbox"/> Computer Architecture</li> <li><input type="checkbox"/> Computer Networks</li> <li><input type="checkbox"/> Defense Systems</li> <li><input type="checkbox"/> Ecological and Environmental Systems</li> <li><input type="checkbox"/> Electronics</li> <li><input type="checkbox"/> Electro-optics</li> <li><input type="checkbox"/> Embedded Systems</li> <li><input type="checkbox"/> Geophysical Systems</li> <li><input type="checkbox"/> Manufacturing</li> <li><input type="checkbox"/> Marine Applications</li> <li><input type="checkbox"/> Materials Science</li> <li><input type="checkbox"/> Mobile Communications</li> <li><input type="checkbox"/> Multimedia</li> <li><input type="checkbox"/> Performance Optimization</li> <li><input type="checkbox"/> Power Plant Simulation</li> <li><input type="checkbox"/> Real Time Systems</li> <li><input type="checkbox"/> Robotics</li> <li><input type="checkbox"/> Semiconductor Design</li> <li><input type="checkbox"/> Telecommunications Systems</li> </ul> | <p><input type="checkbox"/> <b>4. Education, Training and the Profession</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Curricula and Academic Programs</li> <li><input type="checkbox"/> Ethics in Modeling and Simulation</li> <li><input type="checkbox"/> Modeling and Simulation in Education</li> <li><input type="checkbox"/> Professional Certification</li> </ul> <p><input type="checkbox"/> <b>5. Applications in Social Sciences and the Humanities</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Artificial Life</li> <li><input type="checkbox"/> Business Applications</li> <li><input type="checkbox"/> E-commerce</li> <li><input type="checkbox"/> Economics</li> <li><input type="checkbox"/> Entertainment and Games</li> <li><input type="checkbox"/> Transportation and Traffic</li> </ul> <p><input type="checkbox"/> <b>6. Applications in Management, Planning and Forecasting</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Emergency Planning and Management</li> <li><input type="checkbox"/> Financial Planning</li> <li><input type="checkbox"/> Information and Decision Support Systems</li> <li><input type="checkbox"/> Infrastructure Planning and Design</li> <li><input type="checkbox"/> Inventory and Production</li> <li><input type="checkbox"/> Scheduling</li> </ul> <p>Other: _____</p> |
|---|---|---|--|

## ANNUAL MEMBERSHIP DUES

**Dues for regular and student membership in SCS include a subscription to *Modeling & Simulation* Magazine online.** In addition, SCS members may elect to receive printed publications at discounted prices. Please check the appropriate line.

- Regular Service Level @ \$55.00 (U.S.) per year  
 Professional Service Level @ \$95.00 (U.S.) per year  
 Premier Service Level @ \$195.00 (U.S.) per year  
 Student Member\* @ \$22.00 (U.S.) per year \*Proof of student status required.

## PAYMENT METHOD

\*Please send a xerox copy of your student ID including a Professor's signature verifying your student status to the SCS office.

- Payment enclosed. Make checks payable to SCS  
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Card Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_ Signature: \_\_\_\_\_

## MEMBERSHIP FEES

## TOTAL AMOUNT DUE

**THE REGULAR MEMBERSHIP SERVICE LEVEL** annual dues are \$55 (US). Membership benefits provided at this service level include:

- Electronic access to the new monthly flagship publication called *M&S Magazine*
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- Printed version and electronic access to the new archival journal *SIMULATION: Transactions of The Society for Modeling and Simulation International*, as provided by Sage Science Press.
- Unlimited access to the new SCS online publications archive
- Discounts on the full range of SCS products (e.g., books, conference registration, etc.)

The Society for Modeling and Simulation International (SCS) is a registered 501(c)3 not-for-profit organization, meaning some portion of your membership fees may be tax deductible.

The SCS Board of Directors provides the agenda and makes all decisions about the products and endeavors of the Society, and is elected bi-annually by the SCS Membership. All members are urged to take responsibility for nominating those persons that are interested and capable of leading and guiding SCS in the growth, relevance, and accomplishments of the modeling and simulation community. Any member who would like to volunteer his/her energies in helping SCS accomplish its mission is urged to indicate interests in the “Volunteer” information box provided below.

Founded in 1952, SCS has been making simulation work for fifty years...and counting.

With your interest, participation, and leadership, SCS will continue to lead the charge of modeling and simulation to the technological forefront of academia, government and industry throughout the world.

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## **BECOMING ACTIVE IN THE SOCIETY**

- I would be willing to review technical articles for the Society in my fields of interest
- I would like to become active in simulation conferences
- I would like to do the following: \_\_\_\_\_

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**Return to: SCS Membership, P.O. Box 17900, San Diego, CA, USA 92177-7900**  
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**The Society for Modeling and Simulation International**  
**2004 ADVANCED SIMULATION TECHNOLOGIES CONFERENCE**  
**April 18–22, 2004 • Hyatt Regency Crystal City • Arlington, Virginia, USA**

## AUTHOR REGISTRATION FORM

Reservations must be received by March 17, 2004 to qualify for conference rate.

Those received after this date will be accepted on a space available basis only.

***This registration form must be completed and returned with your manuscript. Registration fee must be guaranteed by receipt of check or credit card number for paper inclusion in Conference Proceedings. Registration is not refundable.***

Registration fee includes: attendance at the conference, authors breakfast, a CD of all papers that were electronically submitted for the ASTC 2004 conference, and any planned all-conference function. Social events and print proceedings are subject to additional fees.

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Organization: (for badge) \_\_\_\_\_

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Paper Title (2): \_\_\_\_\_ Paper #: \_\_\_\_\_

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\* All Checks must be made payable to SCS and drawn on US banks or International Money Orders in US funds

\*\* Must provide proof of current student status; all authors must be students



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Departure Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Please reserve accommodations for:

**Name:** \_\_\_\_\_

**Sharing room with:** \_\_\_\_\_

**Company:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City:** \_\_\_\_\_ **State:** \_\_\_\_\_ **ZIP:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_ **Fax Number:** \_\_\_\_\_

**Credit Card Number:** \_\_\_\_\_ **Expiration Date:** \_\_\_\_\_

**Cardholder's Name:** \_\_\_\_\_

**Room Preference:**  Smoking  Non-Smoking **Room Type:**  King  2 Double Beds  
(Room Rate is based on availability)

**Room Rate:**  Single: \$150.00  Double: \$150.00  Triple: \$170.00  Quad: \$190.00

Add 9.75% Hotel Tax

*Hotel check-in is 4:00 p.m. and check-out is 12:00 noon.*

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Arlington, Virginia 22202, USA  
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