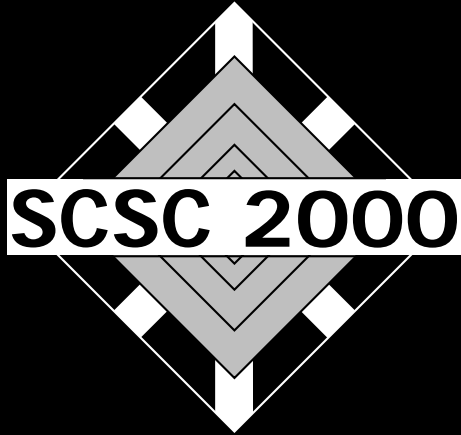


PRELIMINARY PROGRAM FOR THE
2000 SUMMER COMPUTER SIMULATION CONFERENCE &
THE 2000 SYMPOSIUM ON PERFORMANCE EVALUATION
OF COMPUTER AND TELECOMMUNICATION SYSTEMS



VANCOUVER, BRITISH COLUMBIA
JULY 16-20, 2000



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The following pages describe the presentations and events of both the **2000 Summer Computer Simulation Conference (SCSC'00)** and the **Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS'00)**. These conferences feature contributions in all aspects of simulation and modeling relating to discrete, continuous, and combined systems. Sessions will be organized to discuss current modeling and simulation practices, innovative approaches, and research results. Registrants receive ONE copy of the **2000 Summer Computer Simulation Conference CD-ROM** or **SPECTS 2000 Proceedings** as part of their registration fee.

SCSC/SPECTS '00 HAPPENINGS

Sunday, July 16

- Professional Development Workshops
- SCSC Executive Committee Meeting
- SCSC/SPECTS'00 Conference Registration
- MISS Annual Meeting
- Exhibitor Set-up
- SCSC 2000 Program Committee Meeting
- SPECTS 2000 Executive Committee Meeting
- SCSC/SPECTS'00 Welcome Reception

Monday, July 17

- Speaker's Breakfast
- Keynote Speaker & General Session
- Technical Sessions Begin
- SCSC Open Membership Meeting
- SCSC Past Presidents Meeting
- 2000 Pacific Rim Regional Council (Meeting & Reception)
- SCSC/SPECTS'00 Reception

Tuesday, July 18

- Speaker's Breakfast
- Plenary Speaker
- Technical Sessions Continue
- SCSC Standards Meeting
- SCSC Publications Board Meeting
- SCSC 2001 Planning Meeting
- SCSC Western Regional Council Meeting
- SPECTS 2001 Organization Meeting
- PECTS Interest Group Meeting
- SCSC/SPECTS'00 Dinner Cruise (optional)

Wednesday, July 19

- Speaker's Breakfast
- Plenary Speaker
- Technical Sessions Continue
- SCSC/SPECTS'00 Conference Luncheon
- Exhibition Closed
- SCSC Senior VP Board Meeting
- SCSC Bylaws and Policy and Procedures Meeting
- SCSC Nominating Meeting
- SCSC Conference Board Meeting

Thursday, July 20

- SCSC Board of Directors Annual Meeting
- Professional Development Seminars

ABOUT SCS INTERNATIONAL

Established in 1952, The Society for Computer Simulation International (SCS) is the only technical society dedicated to advancing the use of computer simulation in all disciplines to solve real-world problems.

PECTS TECHNICAL CHAPTER MEETING

The annual meeting for those interested in the Performance & Evaluation of Computers and Telecommunication Systems. Agenda for this meeting includes establishing leadership for the chapter and planning the continued excellence of the SPECTS conference series. Those who are unable to attend but are interested in the activities should e-mail Dr. Mohammad Obaidat, founder of the PECTS organization at obaidat@monmouth.edu.

ACSL USER GROUP MEETING

AEgis Research Corporation will hold its annual North American ACSL User Group Meeting at the Summer Computer Simulation Conference. Highlights of this session include an overview of current ACSL product status, future plans for ACSL, user presentations and questions/answers. For more information on ACSL, visit www.ACSLsim.com.

DINNER CRUISE ON ENGLISH BAY

Tuesday Evening

Cost: \$25.00 per person

Limit: 100 people, preregistration required

Join your fellow SCSC/SPECTS'00 attendees for a dinner with panoramic views of Vancouver's splendor from aboard a luxury yacht. Cruise Vancouver's harbor and spectacular waterfront estates, leaving from the conference hotel following the completion of last sessions Tuesday. Sign up on Registration Form.

AMC DISTRIBUTED SIMULATION

WORKING GROUP

July 16 & July 20, 2000

The Theme of the working group conference will be "Evolving Simulation Technologies Outside of the US Military." AMC membership will meet Sunday evening and Thursday morning.

SISO STUDY GROUP ON THE ECONOMICS OF SIMULATION

The Simulation Interoperability and Standards Organization study group on the economics of simulation will meet to pursue its activities in (1) Establishing lexicon to simulation economics, (2) Gathering data on cost and value of simulation, (3) Building a business case template for simulation, and establishing one or more models of the simulation industry market.

E.T. OF M&S TOOLS

Professor Maurice S. Elzas

Professor Emeritus, Knowledge Systems, Applied Computer Science Department, Wageningen University

The full title of this paper is actually "European Tales of Modelling and Simulation Tools." The link with the "Extra Terrestrial" is relevant because, for many years, Europeans and their ideas in this field most often appeared to come from outer space to their colleagues in North America.

The Europeans' measurable difference in approach to modelling and simulation was largely caused by particular differences in historical and scientific perspective. Also the funding of developments, the nature of the simulation market and – last but not least – the perceived relative importance of sound theoretical foundations versus methodologies based on practical experience contributed to this gap in appreciation.

The sequel will endeavor to delve into the details of these original differences, highlight successes and failures and will, finally, attempt to give the reasons why, in the past decade, both worlds have become so close-knit that any differences remaining are hardly discernible.

SCSC 2000 CHAIRS

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British Telecom, UK

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Mohammad S. Obaidat
General Chair, SPECTS 2000
Senior Member, SCS

"PERFORMANCE EVALUATION IS
VITAL FOR EFFICIENT SYSTEM DESIGN
IN THE NEXT MILLENNIUM"

Welcome to the 2000 Symposium on Performance Evaluation of Computer and Telecommunication Systems, SPECTS 2000. As we move into the new millennium, SPECTS continues its mission as a premier international conference focusing on the research and practice of performance evaluation of computer and telecommunication systems.

SPECTS 2000 offers a unique forum for researchers and practitioners from academia, industry, and government to share their expertise, results and achievements in all areas of performance evaluation of computer and telecommunications systems, including simulation, analytic modeling and measurements.

The theme of this year's conference, "Performance evaluation is vital for efficient system design in the next millennium," reflects the importance of this discipline in the new millennium where computer and telecommunication systems and their applications are becoming more and more complex, and globally widespread.

The program consists of two parallel tracks per day and will last for three days. Each track has three sessions. The topics covered in the program include ATM systems, high-speed networks, high-performance computing/computers, memory systems, Internet, wireless communications, parallel and distributed systems, computer architecture, queues, TCP/IP systems, fault-tolerant systems, authentication, parallel and distributed simulation, QoS, routing, flow control, client-server systems, GSM, load balancing, multimedia, and Web-based applications. We received a large number of high quality papers this year. We accepted only the very highest. We have two categories of accepted papers, regular papers and short papers. Regular papers were allowed a maximum of eight printed pages, while short papers were allocated a maximum of five printed pages.

Finally, on behalf of the Executive and Steering Committees of SPECTS 2000, and the Society for Computer Simulation International, I invite all of you to enjoy the conference and the gorgeous July weather of Vancouver.

Mohammad S. Obaidat
General Chair, SPECTS 2000



William F. Waite
General Chair, SCSC 2000

"MAINSTREAM SIMULATION"

Welcome to the 2000 Summer Computer Simulation Conference (SCSC 2000), your portal to the Modeling and Simulation Industry of the 21st Century! The theme for this year's conference is: "**MAINSTREAM Simulation** – SCSC 2000 addresses the MAINSTREAM of simulation...in the MAINSTREAM of world-wide business, government, and education."

The simulation industry is changing rapidly in response to economic imperatives and technological opportunity. Fueled by economic pressure, simulation is becoming pervasive in public and private enterprise. Facilitated by emerging standards and infrastructure, the long-awaited simulation intervisibility, interoperability, and re-use among heretofore segmented simulation markets are becoming practical. Simulation application domains that have been insular and specialized are beginning to share concepts, practices, and assets at an accelerating pace.

The SCSC 2000 meeting emphasizes topics of synoptic interest to the entire modeling and simulation community. Papers and panelists from a wide range of application domains were solicited. Consequent participation by diverse simulation communities is expected to heighten awareness at the meeting of the significant similarities that characterize modeling and simulation technology and practice within the industry. By sampling generously across the industry, we expect to discover those topics which are most generally important and which best admit to inter-domain collaboration.

A full program of activities is planned for the SCSC 2000. *Invited Speakers* provide senior executives' views of the evolving simulation landscape. *Paper Sessions* report practitioners' progress in addressing issues of general concern. *Panels* provide cross-domain review of selected issues. *Workshop Sessions* provide a structured, moderated venue for the collegial investigation of topics admitting to subsequent ACTION. And *Exhibits* afford vendors and users of simulation products and services the opportunity to demonstrate their wares and capabilities.

As SCSC 2000 participants, I encourage you to discover *and invent* for yourselves the trends that will dominate the evolution of the 21st Century Simulation Industry!

William F. Waite
General Chair, SCSC 2000

(1) The Role of Optics in the Design of a Next Generation Supercomputer. Photons Will Determine Communications in the Next Generation Supercomputers.

Sunday 8:00am–12:00pm Cost \$200

Scientists all over the world agree that the 21st century will see a major breakthrough in exploring new technologies in various areas of science. Already in 1993 Kenneth Wilson, former Nobel physicist, prognosticated the importance of grand challenges for the next century. In a report associated with the high performance and communications phenomena, a list of subjects was published that referred to simulations with regard to the design of new drugs and protein structures, to studies on the behaviour of ozone depletion, to the origination of air and water pollution, and to the prediction of a 12-hour weather forecast. In achieving this, a parallel processing and networking platform is required that performs at processing speeds of trillions of operations per second, the results of which are successively distributed among computing nodes at speeds exceeding terabits per second data-throughput rates, and next stored in terabytes-sized memories. Starting as an idea at Delft University of Technology in 1985, which is now further elaborated upon at the College of Engineering, Computer Science and Technology at California State University, Chico, a more or less radical approach was introduced in designing an optically interconnected parallel computing system in which every node talks to every other node all the time, with no switching required at all. Although it is still far from being in a position to be prototyped, it is our sincere believe that it is worthwhile to pursue a fully connected architecture, because all other existing network topologies are just subsets of it. This is of crucial importance if we are to come up to expectations where data throughput rates of terabits per second are realized. In considering an exploration of the use of optical interconnections, only a system-to-device approach will survive. Moreover, in maintaining properties of optics-inherent parallelism to the farthest end (in this case the electronics within a node), a combination of an optical data distributor and a class of photonic integrated circuits (PIC's) has to be designed that distribute, fetch and store that data in one blow. The beauty of optical processing and connectivity: data travels from a source node to a destination node at the speed of light without encountering bottlenecks of any kind.

Edward E. E. Frietman received his BSEE, MSEE and PhD degrees from Delft University of Technology (DUT) at Delft in The Netherlands. Currently he is a Visiting Professor at the Faculty of Applied Sciences at DUT, where his research activities are focused on computer architectures, optical interconnect technologies for massively parallel processors, and semiconductor technologies for opto-electronic integrated circuits.

(2) Verification, Validation and Accreditation of Models and Simulations

Sunday 1:00pm–5:00pm Cost: \$200

In this practical Verification, Validation, and Accreditation course, you will gain the knowledge necessary to ensure your M&S data are accurate. The goal of this course is to prepare you to make an informed and independent judgment about the credibility of models and simulations being used in the program or project of interest to you. You'll also gain a working knowledge of the activities required to certify a simulation as credible for a specific application. Other important subject matter includes the following: the M&S VV&A process and its relationship to various M&S applications; fundamentals and techniques for performing M&S VV&A and guidance to help the trainee determine which techniques are most useful for certain application types; the accreditation process and the work that must be accomplished to reach a sound decision about the suitability of M&S for particular applications; planning for and implementing the accreditation process and how to integrate V&V into the process; validation planning and reporting. Your successful implementation of VV&A is of undeniable value to your organization. Your organization may save time and money, reduce risk, and have a greater certainty that the M&S environment is performing as required through implementation of formal M&S VV&A processes. Value to attendees: This timely and topical course is intended to aid decision makers in ensuring the quality of their modeling and simulation environment. Leveraging its extensive training experience in High Level Architecture, and using Department of Defense VV&A guidance coupled with industry best practices, AEGIS has developed this multimedia training course to address many of the questions that arise when M&S are used in critical applications. This tutorial uses state-of-the-art, computer-based multimedia presentations to illustrate M&S VV&A in an easy-to-understand manner. Each multimedia presentation is followed by discussions to encourage communications and facilitate the exchange of information of most value to the participants. Participants will be provided a Student Guide and CD-ROM which encapsulates all the material presented in the tutorial.

Bob Gravitz has nearly 20 years of experience in the fields of research, development, test, and evaluation (RDT&E) of major DoD weapon programs, and his focus has been the application of M&S to weapon systems development and testing. He has current, hands-on experience with the National Missile Defense (NMD) Program and the Theater Missile Defense (TMD) Family of Systems (FoS) and serves as the Director of the Systems Engineering and Evaluation Technology Group of The AEGIS Technologies Group.

(3) Improved Software Testing with the Use of Metrics

Sunday 1:00pm–5:00pm Cost: \$200

Software Metrics can aid in improving your organization's testing process by (1) providing insight and early visibility into the "real" status of the testing effort, (2) aiding in making assessments as to whether progress, productivity and quality goals are being met. This tutorial presents a practical guide on how to start taking advantage of these new tools/techniques to aid in improving the testing process. These metric-based tools and techniques have successfully been used by (1) software test teams, (2) software developers and, (3) SQA/IV&V staffs. This tutorial and practical overview is designed for technical and managerial professionals concerned with improving quality, performance and productivity of the software testing phase.

Alfred Sorkowitz is a Computer Scientist with the Department of the Navy, and is actively involved in utilizing software engineering principles to develop large software-based systems.

(4) Overview of the SPEEDES Framework

Thurs. 9:00am–5:00pm Cost: \$200

Jeffrey S. Steinman, Vice President and Director of Technology with RAM Laboratories, received his PhD in High-Energy Physics from UCLA in 1988. From 1988-1995, Dr. Steinman worked at the Jet Propulsion Laboratory where he developed the SPEEDES operating system. This work resulted in more than 30 publications in the area of high-performance simulation, and four patent awards. He has provided technical support for several large-scale DoD projects including JSIMS, JWARS, JMASS, Wargame 2000, NSS, EADTB, and the SPEEDES-based HPC-HLA-RTI development effort. Dr. Steinman is currently the Technical Director for the SPEEDES simulation engine upgrades in support of JSIMS.

SPEEDES is currently being used by several large distributed DoD simulation programs including JSIMS, JMASS, Wargame 2000, and EADTB. SPEEDES is also being extended to provide a High-Level Architecture (HLA) Run-Time Infrastructure (RTI) on High-Performance Computers. This tutorial discusses the following topics:

1. Principles of Optimistic Time Management
2. Internal Design of SPEEDES
3. SPEEDES Modeling Framework
4. Federation Objects
5. Interoperability and Support for HLA

Upon completion of this tutorial, attendees will have a firm grasp of how optimistic time management works. Attendees will also gain basic understanding of SPEEDES capabilities and how it is used to support parallel and distributed simulation models.

(5) Creating Distributed Simulations: The DEVS, HLA, CORBA Triad

Thurs. 9:00am–4:00pm

The tutorial has two parts. Cost is as follows:

Part 1 - \$125

Part 2 - \$125

Parts 1 & 2 - \$200

The US Department of Defense and NATO are promoting the High Level Architecture (HLA) standard for distributed simulation, focusing on interoperability of existing geographically dispersed simulation assets. However, non-DoD applications of distributed modeling and simulation, such as in distributed business enterprises and e-commerce, are becoming increasingly important as complexity increases and lead times diminish. Moreover, some of the difficulties faced in creating distributed modeling and simulation environments are not addressed by the HLA prescriptions and run-time infrastructure. CORBA is a widely accepted middleware to support distributed software systems and offers complementary services to those of HLA. This tutorial is oriented to those tasked with developing modeling and simulation infrastructures and who want to gain a better understanding of the options available to them. The presentation is based on the Discrete-Event System Specification (DEVS) which is an increasingly accepted framework for understanding and supporting the activities of modeling and simulation. Examples of industrial-strength environments that have been implemented in using the DEVS framework with either HLA or CORBA are also reviewed.

The tutorial consists of two parts.

Part 1: (9:30am–12:00pm) The DEVS Framework is oriented to those unfamiliar with DEVS and its comprehensive view of modeling and simulation—model developers, users of simulation tools, distributed simulation managers and developers. This part is prerequisite to Part 2, but may be skipped by those who are knowledgeable with the DEVS Framework.

Part 2: (1:30pm–4:00pm) The DEVS, HLA, CORBA Triad will be of interest to those who want to gain an appreciation for the possibilities, problems and solutions available in developing distributed simulation infrastructures—managers and developers, and DoD and civilian infrastructure investment decision makers.

Bernard P. Zeigler, University of Arizona, has made fundamental contributions to modeling and simulation, is a Fellow of the IEEE, and recently received the SCS McLeod Founders Award.

Hessam S. Sarjoughian, University of Arizona, is an Assistant Research Professor in Electrical and Computer Engineering, and has developed software and course materials to support DEVS methodology using advanced distributed software technologies.

(6) Introduction to the High Level Architecture (HLA) and Supporting Processes/Tools

Thurs. 8:00am–12:pm

Cost: \$200

This tutorial is being given in two parts. The first section will provide a comprehensive introduction to the US Defense Department High Level Architecture (HLA) for Simulation. It is designed primarily for those who are unfamiliar with the HLA, but may also be useful for those who desire a refresher on basic aspects of the HLA. The first segment includes an overview of the motivations for HLA development, including HLA goals, policy, and development process. The next segment offers descriptions of the latest versions of the three components of the HLA definition: the HLA Rules, the HLA Interface Specification and the HLA Object Model Template (OMT). A third segment offers a look at the nature and scope of the HLA services made available by DMSO and being used internationally. The tutorial will conclude with a 22-minute video featuring US Defense Department personnel speaking to specific real-world problems being addressed by distributed simulation, and how HLA is being employed in solving those problems.

The second section of the tutorial will focus on the HLA Federation Development and Execution Process (FEDEP) Model. The purpose of this tutorial is to introduce users and developers of distributed simulation applications to the set of activities that are necessary to build HLA federations, and to the interrelationships between these activities. This tutorial also provides an introduction to the HLA Tool Architecture, and illustrates how both commercial and DMSO-sponsored tools may be used to automate many different aspects of federation development. Finally, information will be provided as to where and how to gain access to HLA support tools, and how the HLA user community can actively participate in the continued evolution of the HLA FEDEP.

Michael Lightner is the Technology Group Leader for the Simulation Technologies Group at AEGIS Research Corporation. He is also currently serving as the Project Manager for the Defense Modeling and Simulation Office (DMSO) High Level Architecture (HLA) Integrated Training Program.

Jake Borah has been associated with the Joint Simulation System (JSIMS) from the origination of the Joint Program Office. He was a member of the JSIMS Joint Mission Space Model modeling team that was a DMSO-sponsored initiative in conceptual modeling. He also supported the HLA Object Model Template Working Group and the Joint Training Federation prototype project.

Tracie McGuire is a graduate of the United States Military Academy School of Music. After her service in the United States Army, she worked on numerous DOD contracts as a software developer.

(7) Adapting Your Simulation To Use HLA

Thurs. 1:00pm–5:00pm

Cost: \$200

This tutorial will aid in planning the adaptation of legacy simulations to use HLA, and will be presented in three modules. The first module is designed to help analysts plan for HLA implementation. It provides guidance on how to design your first SOM and then describes how to identify which RTI services your simulation requires. The second module focuses on software implementation issues that arise when adapting a simulation to use HLA. Interoperability topics discussed include: time management, two-way interfaces, modularity, automating exception handling, and data representation. The third module is a case study which demonstrates how the Naval Simulation System applied the ideas presented in the earlier modules. The overall approach presented here can be used to adapt other simulations for HLA use as well.

David McGuire is a Senior Software Engineer who has been working in the modeling and simulation industry for 12 years. He has helped develop a commercial modeling and simulation architecture as well as build new simulations and integrate existing ones. He is experienced with the HLA Federation Development and Execution Process (FEDEP), as he used the process during an effort to integrate distributed virtual flight simulators. He has also conducted evaluations of various RTIs to determine their suitability to various integration efforts he has been involved in.

Tracie McGuire is a graduate of the United States Military Academy School of Music. After her service in the United States Army, she worked on numerous DOD contracts as a software developer. In addition, she provided training on the products as well as technical support. She has won numerous public speaking awards, currently is a member of the SISO organization and is actively supporting HLA training as well as training on HLA LabWorks.

(8) Simulation and Analysis with ACSL

Sunday 8:00am–12:00pm

Cost: \$200

An overview of the ACSL family of simulation software products: the Advanced Continuous Simulation Language (ACSL); the ACSL Graphic Modeller for creating and maintaining simulations using a graphical interface; ACSL Math for analysis and visualization of simulated time history data; and ACSL Optimize for optimization and parameter estimation of ACSL simulations. A simple case study will trace the application of each product. Tutorial registration includes a free trial of the software products on a PC.

Joseph S. Gauthier is the co-author of ACSL, and Software Technical Advisor at the AEGIS Technologies Group. Mr. Gauthier is a Senior Member of the Society for Computer Simulation with nearly 30 years of experience in the field of continuous system simulation.

G-NETWORKS: SIMULATION AND MODELLING OF NETWORKS WITH CONTROL FUNCTIONS

Erol Gelenbe

School of Electrical Engineering and Computer Science
University of Central Florida

Tuesday 8:30–10:00

Over the last decade, we have introduced new queueing network models with “negative and positive” customers, as well as with “triggers,” and have shown that these new stochastic models have product form solutions.

Triggers or signals are special forms of customers whose role is to move other customers from some queue to another queue. Thus they can be used to model explicit controls in systems, such as acknowledgement packets in networks, or messages signifying the need to transfer some work for one processor to the other in a distributed system. Positive customers are the usual customers of a queueing network, while negative customers are used to remove or destroy customers either singly or in batches.

We have developed these models both for single and multiple class representations, and have applied them to a variety of systems. These models also bear a very interesting relationship to neural networks, and this property has been exploited by several authors.

In this presentation, we will survey the main results concerning G-Networks and show how they can be used to model and simulate packet switching networks with adaptive routing.

Erol Gelenbe (IEEE Fellow '86) is Professor of Computer Science and Director of the School of Electrical Engineering and Computer Science at the University of Central Florida.

TRAINING AND SIMULATION: NATIONAL PRIORITIES

Frederick L. Lewis
Rear Admiral, USN (Ret.)

Monday 8:30–10:00

Admiral Lewis will address the fact of simulation's achieving standing as a recognizable and significant enabling technology on the national and worldwide agenda. His remarks will illustrate how simulation is becoming identified as a critical discipline and industry, and how simulation is beginning to be appreciated as an essential element of tomorrow's technical infrastructure.

Fred Lewis graduated from the US Naval Academy in 1962 and was designated a naval aviator in November 1963. After an initial tour of duty as a flight instructor, he trained in the F-4 Phantom and participated in numerous operational deployments to the Atlantic and Pacific, and twice deployed to the Gulf of Tonkin for combat operations over North Vietnam. Subsequently, he attended the US Naval Test Pilot School and led the stand-up of the Atlantic Fleet's F-14 FRS. Several command assignments followed including his first carrier air wing command when he led the wing in successful operations in the Gulf of Sidra, during which his pilots downed two Libyan fighter aircraft. Various staff assignments in Washington, DC, followed, after which he was given his second air wing command when he inaugurated the Navy's “Super CAG” program. Flag assignments including Director, Strike and Amphibious Warfare, Commander, Tactical Wings, Atlantic, and Commander, Naval Safety Center followed in quick succession. He was sent back to sea in 1991 as Commander, Carrier Group FOUR and Commander, Carrier Striking Forces, Atlantic. During a 33-year career, he accumulated over 6,500 accident-free flying hours in tactical aircraft and over 1,200 carrier arrested landings.

TELECOMMUNICATIONS TRAFFIC MANAGEMENT AND TESTING

Raj Jain
Ohio State University

Wednesday 8:30–10:00

Raj Jain is a Professor of Computer and Information Science at Ohio State University in Columbus, Ohio. He is very active in the areas of traffic management and quality of service in data networks. His research has influenced the directions of traffic management and testing working groups of the ATM Forum. He is an active participant in several other industry forums including Internet Engineering Task Force (IETF), Institute of Electrical and Electronic Engineering (IEEE), American National Institute (ANSI), and Telecommunications Institute of America (TIA).

He is a Fellow of both IEEE and ACM, and a member of the Internet Society, Optical Society of America, Society of Photo-Optical Instrumentation Engineers (SPIE), and Fiber Optic Association. He is currently a Distinguished Lecturer for the IEEE Communications Society. He has been giving tutorials on “Hot Topics in Networking” covering the latest advances at NetWorld +InterOp since 1995.

Based on his active participation in the computer industry, Dr. Jain was awarded the 1999 SiliconIndia Leadership Awards for Excellence and Promise in Business and Technology. He is also the recipient of the 1999 Lumley Engineering Research Award and the 1996 Research Accomplishment Award by Ohio State University, College of Engineering, and the 1995 Ameritech Prize by Ohio State University.

Raj Jain received a PhD degree in Computer Science from Harvard in 1978. His current research interests are in traffic management, performance testing, network management, voice and video over networks, and wireless networks.

THE EVOLUTION OF THE SIMULATION INDUSTRY

Dennis K. McBride
Executive Director
Institute for Simulation and Training

Wednesday 12:00–1:30
SCSC 2000 Luncheon Speaker

Dr. McBride will address the evolution of the simulation industry from the perspective of today's complex enterprise structures. His remarks will illustrate the inevitably intimate relationships among industry, academia, and government in the development of the simulation industry, and will indicate the opportunities available to take advantage of flexibility of enterprise structure and concepts of operations in responding to the burgeoning demand for simulation expertise, infrastructure, and applications.

Dennis McBride is the Executive Director of The Institute for Simulation and Training and Professor of Engineering and of Psychology at the University of Central Florida. He holds a BS, MS, and PhD from the University of Georgia; an MSPA, MPA and MS Systems from the University of Southern California; and is near completion of a second PhD from the London School of Economics. He recently finished a 20-year career as a uniformed US Navy scientist, serving in six laboratories and headquarters, including the Office of Naval Research, Office of the Assistant Secretary of the Navy, and the Defense Advanced Projects Agency (DARPA), America's leading high technology agency, where he managed a national effort in networked simulation. Dr. McBride has authored more than 100 papers in biology, engineering, public policy and other disciplines. He is currently moving IST into realms of entertainment and most importantly, advanced distributed learning, where the emphasis is on networked learning experiences for the new millennium.

SYMPOSIUM ON PERFORMANCE EVALUATION OF COMPUTER AND TELECOMMUNICATION SYSTEMS

General Chair: Mohammad S. Obaidat, *Monmouth University*

Vice General Chair: Marco Ajmone Marsan, *Politecnico di Torino*

MONDAY

TRACK 1

Session 1: ATM I

Hardware/Software Tradeoffs for IP-Over-ATM Frame Reassembly in an Integrated Architecture

P.M. Ewert, N. Manjikian, *Queens University, Canada*

Modeling, Simulation and Performance Evaluation of ATM Switches

P.J. De Freitas Fitho, J.F. Cunha, *Univ. Federal de Santa Catarina, Brazil*

Congestion Management in ATM Networks Using Large Deviations Principle

C.B. Ahmed, N. Boudriga, M.S. Obaidat, *Monmouth University, USA*

Session 2: ATM II

Scalability Study and Distributed Simulations of an ATM Network Management System Based on Intelligent Agents

P. Vilà, J.L. Marzo, *Universitat de Girona, Spain*

Multiplexing of Video and Data Sources in an ATM Access Network

B. Kraimeche, *Stevens Institute of Technology, USA*

Analysis of a Distributed Alternate Routing Strategy for ATM Networks

R. Bolla, P. Castelli, F. Davoli, M. Marchese, *University of Genoa, Italy*

Inverse Multiplexing for ATM Performance Evaluation Under Different Traffic Patterns

M. P.-Box, J.G.-Harò, M. Algartua, *Polytechnic Univ. of Catalonia, Spain*

Session 3: Resource Allocation

Comparison of Fair Bandwidth Allocation Techniques in Multi-Rate Loss Networks

G. Fodor, G. Malicsko, *Ericsson Research, Sweden*

Effective Bandwidth and Associated CAC Procedure for Traffic Streams Multiplexed Over a VBR Link

A. Rácz, N. Fias, P. Rácz, *Ericsson Kft., Hungary*

Fair and Stable Resource Allocation Methods for Guaranteed Service

K. Oida, *ATR Adaptive Communications Research Laboratories, Japan*

Modem Pool Simulation and Performance Analysis

D. Novak, D. Rowland, M. Stepanek, D. Wastkins, L. Da Silva, *Virginia Tech, USA*

Upstream Bandwidth Allocation for Packet Telephony in Hybrid Fiber-Coax Systems

Wai Sum Lai, *AT&T Labs, USA*

TRACK 2

Session 1: Performance Optimization I

Efficient Recursive Performance Optimisation of Communication Networks Via Simulation

R.K. Boel, S. Deman, *SYSTeMS Group -Universiteit Ghent, Belgium*

Solution for the Wolf Architecture Load Balancing Problem

M.A. Cavenaghi, Joao A. Martini, A.G. Neto, *State Univ. of Sao Paulo, Brazil*

Flow-Controlled Throughput in Distributed Simulators of Feedforward Queueing Networks

A.Kumar, R. Shorey, *Indian Institute of Technology, India*

A Robust Load Balancer for Heterogeneous Distributed Systems Type-A
Al-Dahoud Ali, *Al-Zaytoonah University, Jordan*

Session 2: Performance Optimization II

Simulation of Vector Computing for Multi-user Detection in Spread-Spectrum Communications

N. Manjikian, *Queen's University, Canada*

Protocol and Evaluation of Transaction Processing Schemes in Agent-Based Distributed Systems

Tien-Fu Chen, Kuei-Jone Chang, *National Chung Cheng University, Taiwan*

On the Important Function in Splitting Simulation

M.J.J. Garvels, D.P. Kroese, J.K.C.W. van Ommeren, *University of Twente, Holland*

A Cycle-Based Approach for Parallel Simulation of Mobile Communications Networks

J. Voigt, G.P. Fettweis, *Dresden University of Technology, Germany*

Session 3: TCP

Performance Characteristics of Multiplexed TCP Connections

T. Larsson, Y. Ismailov, A. Nilsson, *Ericsson Radio Systems, Sweden*

An Approximate GSPN Model for the Accurate Performance Analysis of Correlated TCP Connections

M.A. Marsan, C. Casetti, R. Gaeta, M. Meo, *Politecnico di Torino, Italy*

Towards a Rate Coordination Between TCP and ABR Congestion Control Algorithms

K. Djemame, M. Kara, *University of Leeds, UK*

Performance of TCP Connections in Wormhole Routing and ATM Networks

A. Bianco, E. Leonardi, F. Neri, M. Munafò, *Politecnico di Torino, Italy*

TCP in the Satellite Environment: Analysis and Some Operative Proposals

M. Marchese, *University of Genoa, Italy*

TUESDAY

TRACK 1

Session 1: Routing I

An Efficient Algorithm for Shortest Path Multicast Routing Under Delay Variation Constraints

M.F. Mokbel, W. El-Haweet, M. Nazih El-Derini, *Egypt*

A Distributed Lookahead-N Routing Strategy for High Speed Telecommunications Networks and Its Performance

A. Dalal'ah, M. Obaidat, *Monmouth University, USA*

Routing in TIONets: Using Store and Forward and Hot Potato Schemes

K. Makki, N. Pissinou, A. Gumaste, *University of Louisiana-Lafayette, USA*

Session 2: Routing II

The Tunability of Network Routing Using Online Simulation

H.T. Kaur, K.S. Vastola, *Rensselaer Polytechnic Institute*

Performance Evaluation of Routing Strategies Using Reinforcement Learning

Y.J. Tùpac, M.M.B.R. Vellasco, M.A.C. Pacheco, *ICA: Res. Center of Appl. Computational Intell., Brazil*

Design and Implementation of a New Routing Simulator

P. Zhang, *Helsinki University of Technology, Finland*

Session 3: Scheduling**Evaluating Scheduling Algorithms for Packet Switches with Multiple Input Queues by Simulation**E. Jennings, S. Kuttan, *California State Polytechnic University, USA***Gang Scheduling and I/O Scheduling in a Multiprocessor System**H.D. Karatza, *Aristotle University of Thessaloniki, Greece***Blocking Probability with Time-Driven Priority Scheduling**M. Baldi, Yoram Ofek, *Synchrodyne Inc., USA***The Effects of Granularity and Scheduling Policies on the Performance of Data Parallel Programs**I. Jung, K. Kim, J. Lee, *Korea Advanced Institute of Science and Technology, Korea***TRACK 2****Session 1: Internet - QoS/Traffic I****Delivering End-to-End Statistical QoS Guarantees for Expedited Forwarding**M. Listanti, F. Ricciato, S. Salsano, *Infocom Dept., Italy***A Simulation Study of Adaptive Voice Communications on IP Networks**A. Barberis, C. Casetti, J.C. De Martin, M. Meo, *Politecnico di Torino, Italy***Analysis of Loss Periods for Video Transfer Over UDP**V. Markovski, L. Trajkovic, *Simon Fraser University, Canada***Objective Perceptual Quality Estimation for MPEG-2 Video Streams**S. Giordano, G. Insolvibile, M. Pagano, *Università di Pisa, Italy***Performance Analysis of a Wavelet-Based Hurst Parameter Estimator for Self-Similar Network Traffic**F. Xue, L. Trajkovic, *Simon Fraser University, Canada***Session 2: Internet - QoS/Traffic II****Bandwidth Requirement of a Differentiated Self-Similar Packet Stream**S.M.R. Mahdavian, A. Leon-Garcia, *University of Toronto, Canada***Workload Characterization of Mail Servers**L. Bertolotti, M.C. Calzarossa, *Università di Pavia, Italy***Measurement and Analysis of Wide Area Network (WAN) Traffic**Y. Choi, H. Lee, *HRL Laboratories, L.L.C., USA***Experimental Performance Evaluation of a Flow Control Algorithm for Multimedia Network Applications Over a WAN**A. Iskra, S. Zappatore, *University of Genoa, Italy***Reducing Latency on the Internet Using "Component-Based Download" and "File-Segment Transfer Protocol"**B.S. Noghani, S. Kretschmann, R.D. McLeod, *University of Manitoba, Canada***Session 3: Internet - Security and Services****An Authentication and Digital Signature Scheme Based on Block Cipher Hashing and RSA Cryptography**K.H. Rahouma, P. Zinterhof, *University of Salzburg, Austria***Performance Analysis of an Enhanced-Security Distributed Voting Algorithm**K. Kwiat, B. Hardekopf, *Air Force Research Laboratory, USA***Transport-Oriented Service Models for Multimedia Data Presentation**K. Ravindran, *The City University of New York, USA*

WEDNESDAY

TRACK 1**Session 1: HW/SW Architecture and Performance I****Evaluating an Embedded RISC Core Performance for the ATM Network Interface Processing**A. Elkateeb, M. Elbeshti, *Acadia University, Canada***Jitter Performance of Adaptive Clock Recovery Method: Simulation Results for the Case of a Dedicated Output Buffer for CBR Services**M. Carbonelli, D. De Seta, D. Perucchini, *Fondazione Ugo Bordonani, Italy***Optimal Parallel Integer Sorting on EREW PRAM**H.M. Bahig, S.S. Dawoud, M.K. Khairat, *Ain Shams University, Egypt***Performance Analyzer: A Tool for the IBM OS/390**

M. Radaideh, D.A. Cargill

Session 2: HW/SW Architecture and Performance II**A Configurable Parallel Architecture for Document Management**S. Vagnier, H. Essafi, A. Merigot, *LETI (CEA - technologie Avancée), France***Measuring Data Cache and TLB Parameters Under Linux**C. Thomborson, Y. Yu, *University of Auckland, New Zealand***Issues in Performance Testing for Client/Server Systems**S. Al-Khayatt, J. Coxon, *Sheffield Hallam University, UK***Performance-Oriented Design of Cache Memory Using Fuzzy Replacement Policy**H. Diab, H. Tabbara, *American University of Beirut, Lebanon***Session 3: Optical Networks****An Evaluation of a New Power-Efficient Multicast Wavelength-Routing Switch**M. Ali, J. Deogun, *University of Nebraska-Lincoln, USA***Performance Evaluation of Augmented ShuffleNet Multihop Lightwave Networks**Kwok-Wah Hung, Ka-Lung Chan, *The Hong Kong Polytechnic University, Hong Kong***A New Architecture for Lightwave Networks**A. Sen, S. Bandyopadhyay, B.P. Sinha, *Arizona State University, USA***Wavelength Collision Avoidance in WDM Star Networks: An Optical-Logic-Circuits-Based Approach**A.N. Milliou, G.I. Papadimitriou, A.S. Pomportsis, *Aristotle University-Thessaloniki, Greece***TRACK 2****Session 1: Radio and Satellite I****Traffic Modeling in Hierarchical Cellular Networks**G. Boggia, P. Camarda, N. Di Fonzo, *Politecnico di Bari, Italy***Analytical Call Level Model of GSM/GPRS Networks**K. Begain, M. Ermel, T. Müller, J. Shüler, M. Schweigel, *TU Dresden, Germany***Resource Allocation Schemes for Voice and Data Integration Over Wireless Cellular Networks**W. Ajib, P. Godlewski, *E.N.S.T., France***Performance Evaluation of a Multi-Level Allocation Algorithm for VBR Traffic Over a Geo Satellite**N. Celandroni, E. Ferro, F. Potorti, *Satellite Networks Group, CNUCE/C.N.R., Italy*

A Model for GSM SpeechT. Westholm, B. Olin, *Ericsson Radio Systems, Sweden***Session 2: Radio and Satellite II****Computer Simulation of Performance Enhancing Methods in ATM Based Fixed Wireless Access Networks**I. Forkel, R. Easo, S. Mangold, *Aachen University of Technology, Germany***Performance Comparison of Channel Allocation Strategies in a Cellular Network Over Highways**A. Iscra, P. Maryni, *Italy***A Performance Comparison of Routing Protocols for Mobile Ad-Hoc Networks**D.D. Perkins, H. Hughes, *Michigan State University, USA***Independence Assumption Study for a Satellite Navigation System's Availability Model**M.-L. Yin, C.L. Hyde, R.R. Arellano, L.E. James, *Raytheon System Co., USA***IEEE 802.11 WLAN Versus ETSI Hyperlan Type 1: Performance Comparison Under Influence of Hidden Terminals**Z. Hadzi, V. Spasenovski, B. Spasenovski, *Institute of Telecommunications, Republic of Macedonia***Session 3: Queueing Systems****Queueing of Fixed-Length Messages in the Presence of Server Interruptions**V. Inghelbrecht, B. Steyaert, H. Bruneel, K. Laevens, *Microsoft Research Ltd, UK***Applying Perturbation Analysis to Traffic Shaping**D.C. Lee, *University of Southern California, USA***On Modeling Overhead in Closed Multiple Class Queueing Network Models**M. Curiel, R. Puigjaner, *Universitat de les Illes Balears, Spain***About Traffic Implications on Class Based Queueing Performance Assessments**L. Panico, V. Della Monica, M. Longo, *University of Salerno, Italy***SUMMER COMPUTER SIMULATION CONFERENCE**General Chair: William F. Waite, *AEgis Technologies Group*Deputy General Chair: Abraham Nisanci, *Bradley University***SIMULATION DEVELOPMENT****Simulation Methodologies: Languages, Tools and Techniques**Chair: Ralph Huntsinger, *University of California-Chico***Session 1: Toward Adequate Modeling and Network Management****Strategic Directions in Simulation and Modeling (UK Perspective)**Andrzej Bargiela, *The Nottingham Trent University, UK***An Intelligent Agent Controlled Methodology for Determining Adequate Models**Andras Javor, G. Szucs, *Szechenyi Istvan College, Hungary***Pondering on a Self-Organizing All-Optical Routing System**Edward Frietman, *Delft University of Technology, Netherlands*G.D. Khoe, *Technical University Eindhoven, Netherlands*R. Huntsinger, *California State University-Chico, USA***Network Security Modeling and Cyber Attack Simulation Using the SES/MB Framework**Sung-Do Chi, J.S. Park, K.C. Jung, H.K. Kim, J.S. Lee, *Hangkong University Koyang-si, South Korea***Session 2: HLA and Distributed Simulation****Using Joint Measure to Study Tradeoffs Between Work Traffic****Reduction and Fidelity of HLA Compliant Pursuer/Evader Simulations**S. Hall, S.M Venkatesan, D.B. Wood, *Lockheed Martin Space Systems, USA*H. Sarjoughian, B.P. Zeigler, *University of Arizona, USA***Distributed HLA-Based Simulation with MATLAB**W. Drewelow, *University of Rostock, Germany*Sven Pawletta, *University of Wismar, Germany***In Search of Data Distribution Management in Large Scale Distributed Simulations**Azzedine Boukerche, A. Roy, *University of North Texas-Denton, USA***Design and Implementation of High Performance and High Fidelity Wargame Simulation System**Atsuo Ozaki, M. Furuichi, K. Takahashi, H. Matsukawa, *Mitsubishi Electric Corp., Japan***Effect of Automatic Load Balancing in Conservative Distributed Simulation**Jouni Ikonen, J. Porras, *Lappeenranta University of Technology, Finland***Session 3: 3D Methodologies****Applications for 3-Dimensional Scanning Technology as a Precursor to Simulation and Modeling**Tim Williamson, *University of Wales Institute, UK***Voxel Column Expansion Strategies for Envelope Modeling**Yong Chen, *Purdue University, USA***From the Skull to the Face: Advances in Inverse #D-Simulation**Dietmar Moeller, B. Kesper, S. Bergstedt, *University of Hamburg, Germany*E. Godehardt, J. Koch, *University of Dusseldorf, Germany***Implementation of JAVA 3D API for Multiagent System of Electrical Engineering Virtual Laboratory**Alita Dewi, J.L. Coulomb, R. Pacaut, *Laboratoire d'Electrotechnique, France***Session 4: Logistics and Transportation****MMTS Modeling Methodology Extensions**John Creagh, *Cork Institute of Technology, Ireland***A Simulation Methodology Description of Container Placement Using a Unique System to Control the Logistics**Ralph Huntsinger, *California State University-Chico, USA*M. Itmi, P. Jarjoui, J. Pecuchet, *PSI INSA-ROUEN, France***Factorial Design Solution for Optimal Response Identification**Flavio Tonelli, R. Mosca, *University of Genoa, Italy***Real-Time Traffic Generation for a Driving Simulator Using MATLAB**Harold Klee, *University of Central Florida, USA*

Session 5: Environments for Simulation**The Need for Debugging Tools for Declarative Equation Based Simulation Languages**

Peter Bonus, P. Fritzson, *Linköping University, Sweden*

A Method for an Embedded Explanation Subsystem for Simulation Systems: A Proposal for an Intelligent Simulation Environment

Mhamed Itmi, P. Jarjoui, J. Pecuchet, *PSI INSA-ROUEN, France*
R. Huntsinger, *California State University-Chico, USA*

Using COM to Reduce Development Time and Provide for Future Growth

Curt Ruffing, *Teledyne Brown Engineering, USA*

An Integrated Spreadsheet Approach to Simulation Interfaces

James Leathrum, R.R. Mielke, T. Frith, *Old Dominion University, USA*

Session 6: Modeling and Simulation Environments**An Advanced Modeling and Simulation Tool for Dynamic Systems**

Levent Gokdere, C.W. Brice, R.A. Dougal, *Univ. of South Carolina, USA*

DEVS-Based Multi-Formalism Modeling and Simulation in Modelica

Peter Bonus, P. Fritzson, *Linköping University, Sweden*

Applications of the Cell-DEVS Paradigm

Gabriel Wainer, *Universidad de Buenos Aires, Argentina*

ASL/NSL: A Multi-Level Computational Model for Neural Simulation

Alfredo Weitzenfeld, *ITAM, Mexico*

Kinematics Simulation of Planar Mechanisms, A Proposal of Standard Definition Using XML

Mario Acevedo, M. Aguilar, J. Añorve, *Universidad Panamericana, Mexico*

Session 7: Algorithms and Optimization**Computing a Canonical Bond Graph from a Component-Connection Representation**

Bruno Robisson, J. Ganascia, *Laboratoire d'Informatique de Paris, France*

Stochastic Genetic Algorithm for Simulation Optimization

Young Hae Lee, C. Jeong, *Hanyang University, South Korea*

Multistage Monte Carlo Optimization

William Conley, *University of Wisconsin-Green Bay, USA*
P.J. May, *Schneider Logistics, USA*

Statistical Optimization and the Minimax Transformation

William Conley, *University of Wisconsin at Green Bay, USA*

Session 8: Conducting Manufacturing Simulation**Snoopy Calendar Queue**

Tan Leong, K.C. Chung, T.L. Jin, *NUS, Singapore*

Effectiveness of Static/Deterministic Scheduling Methods in a Dynamic and Stochastic Environment

Rasoul Shafaei, *Khajeh Nasir University of Technology, Iran*

Iteration Time Interval Versus Event Driven Evaluation of a Stochastic Continuous Model

Martin Albertyn, *Gennan Systems, South Africa*

A Scalable Deadlock Avoidance Algorithm for Flexible Manufacturing Systems with Mixed Choices in Part Routing

Robert Lipset, R.P. Judd, W. Zhang, *Ohio University-Athens, USA*

Session 9: Emulation/Simulation of Physical Systems**A Simulation Technique for Codesign of Hardware/Software**

Jianming Cai, I.E. Ritchie, D.W. Lloyd, *London Guildhall University, UK*

Research on Fault Diagnosis of Power Station Thermal Facilities Based on Star-90 Simulation Support System

Ma Liangyu, Wang Bingshu, Ma Yongguang, Tong Zhensheng, *North China Electric Power University, China*

Evaluation of Solar Systems in Jordan Using Fuzzy Sets Programming

Rustom Mamlook, S. Nijmeh, *Applied Science University, Jordan*
B.A. Akash, *University of Qatar*

The Optimization of the Sintering Operation by the Computer Simulation

Juzo Shibata, *Kanazawa Institute of Technology, Japan*

Session 10: Parameter Estimation and Statistics**Analyzing the Sensitivity of Simulation Parameters**

James Leathrum, L. Karlberg, *Old Dominion University, USA*

An Approach for Dynamic System Model Validation and Simulation

Gregory Mealy, A.M. Warlock, *TASC, USA*

Single-Pass Trace Simulation for Superscalar Microprocessors

R-Ming Shiu, *National Chiao Tung University, Taiwan*
C. Chung, *Industrial Technology Research Institute, Taiwan*

Initial Transient Period Detection for Steady-State Quantile Estimation

Jong-Suk Lee, D. McNickle, K. Pawlikowski, *University of Canterbury, New Zealand*

Session 11: Simulation in Biology and Medicine**Simulation of Modular Processes Using Petri Nets: Comparison of Mitosis and Meiosis**

Isaac Barjis, *World Distributed University, Russian Federation*
J. Barjis, *Delft University of Technology, Netherlands*

Partial Fuzzification of Hybrid Time-Discrete Compartment Model of Paracetamol

Ales Belic, R. Karba, *Faculty of Electrical Engineering, Slovenia*
I. Grabnar, A. Mrhar, *Faculty of Pharmacy, Slovenia*

A Simulator for Human Respiratory Control System

Shyan-Lung Lin, *Feng Chia University, Taiwan*

An Evaluation Framework to Support Accuracy Analysis of Computer Assisted Surgery Systems

Warren Viant, *University of Hull, UK*

Some Problems in Sequential Simulation with Self-Similar Processes

Hae-Duck J. Jeong, D.C. McNickle, *University of Canterbury, New Zealand*

High-Speed, Real-Time Simulation Using Parallel Digital Signal Processors

Roy E. Crosbie, *California State University-Chico, USA*
N.G. Hingorani, *Hingorani Power Electronics, USA*

M&S Standards Track

Chairs: Peggy Gravitz and Steve Swenson

Motivational Needs and Requirements for M&S Standards

SISO's Support to Standards

Warren Katz, *Mak Technologies, USA*

The Culture of Standards

Peggy Gravitz, Stephen J. Swenson, *IITRI/Naval Undersea Warfare Center Division Newport, USA*

A Framework for Standards

Jack Sheehan, *Defense Modeling and Simulation Office, USA*

Joint Strike Fighter and M&S Standards

Col. Jim Faye, *Joint Strike Fighter Program Office, USA*

Importance of Standards for Simulation Based Acquisition

Gary N. Bundy, *Army Model and Simulation Office (AMSO)*

Standards Development Strategies and Practices

Panel Discussion–Navy M&S Standards

Stephen J. Swenson, *NAVMSMO, USA*

Panel Discussion–Air Force M&S Standards

Capt. Billy Barnes, *Air Force Agency for Modeling and Simulation, USA*

Panel Discussion–Army M&S Standards

Gary Bundy, *Army Model and Simulation Office (AMSO), USA*

NETWARS C4ISR Communication Modeling Standard

Dr. Albert Legaspi, *SPAWAR Systems Center, USA*

Conceptual Modeling

Furman Haddix, *University of Texas–Austin, USA*

Data Standards Approaches and Solutions

Roy Scudder, *University of Texas at Austin, USA*

M&S Standards and Integrated Natural Environment (INE)

Virginia Dobey, *Acton Burnell / MS Executive Agent (Ocean), USA*

A Virtual Standards Organization

Elizabeth Griffin, *Institute for Simulation & Training, USA*

Simulation Standards - Technical Survey

Navy Training METAFOM

Doug Clark, Jeff Bergenthal, *Analysis and Technology, USA*

Attaining an Authoritative Environment – Using SEDRIS in the Real World

Virginia Dobey, *Acton Burnell / MS Executive Agent (Ocean), USA*

JMASS Simulation Standards – Key to Plug and Play

Robert Lee McCauley, *IIT Research Institute, USA*

Simulation System Architectures

Chair: Robert Lutz

The Simulation System Architectures track provides an open forum for technical managers and system/software engineers to share experiences and lessons learned regarding the architecture design of simulation systems. Papers and panels in this track will highlight innovative architectural solutions to a broad range of practical problems, along with a description of the design methodologies and techniques that produced them. Tools and standards for architecture specification, and the unique issues associated with distributed system development will also be discussed in this track.

Session 1: Architecture Overview

Introduction to 'Software' Architecture

IEEE Recommended Practice for Architectural Description

Bill Waite, *AEgis Technologies Group, USA*

Simulation System Architecture

Session 2: Simulation Environments 1

An Automatic Distributed Simulation Environment

Sarita Bruschi, R.C. Santana, M.J. Santana, *ICMC – USP, Brazil*

The Architecture for Flexible Simulation Environment

Wang WeiPing, Z. YiFang, L. Qun, Y. Feng, *National University of Defense Technology, China*

An Architecture to Support an Extensible and Scalable Simulation

Callie Hill, J. Brock, C.C. Ruffing, *Teledyne Brown Engineering, USA*

Session 3: Simulation Environments 2

Object Oriented Simulation of Distributed Systems Using JAVA and SILK

Emmett Burke, *Symbi System, Inc, USA*

R. Kilgore, *ThreadTec, USA*

G. Leeming, *The Boeing Company, USA*

An Abstract Simulation Model for Mixed-Language Hardware Simulation

Andre Windisch, D. Monjau, *Technical University of Chemnitz, Germany*

T. Schneider, M. Glesner, *Darmstadt University of Technology, Germany*

J. Mades, W. Ecker, *Infineon Technologies, Germany*

Towards the Architecture of Collaborative Virtual Prototyping Environment (CVPE)

Zhao Wen, W. WeiPing, Z. YiFan, Y. Feng, *National University of Defense Technology, China*

Session 4: "J" Program Architecture Review

The Joint Warfare Systems (JWARS) Architecture: A Client-Server, Database Centric Simulation System in Smalltalk

Ron Painter, *JWARS, USA*

An Overview of the Joint Modeling and Simulation System (JMASS)

Vernon Handley, P.M. Shea, *Dynetics, Inc, USA*

M. Morano, *US Air Force, USA*

An Overview of the Joint Simulation System (JSIMS) Architecture

HLA-Federate Reproduction Procedures in Public Transportation Federation

Thomas Schulze, *University of Magdeburg, Germany*

S. Strassburger, *Fraunhofer IFF, Germany*

Session 5: High Level Architecture (HLA) Systems/ Applications

Object Oriented HLA Interface Design for Military Simulations

Steven Hall, S.M. Venkatesan, D.B. Wood, *Lockheed Martin Space Systems, USA*

H. Sarjoughian, B.P. Zeigler, *University of Arizona-Tucson, USA*

An Integrated Architecture for Spacecraft Design and Simulation

Andrew Goldfinger, D.P. Silberberg, J.R. Gersh, J.W. Hunt, G.W. Rogers, F.B. Weiskopf, L.T. Duong, *Johns Hopkins University, USA*

Session 6: Simulation Applications

Chair: Richard Love

The Transportation System Capability (TRANSCAP) Model: A Mixed Language Development Approach for an Army Development Simulation

Richard Love, J.F. Burke, Jr., C.M. Macal, D.L. Howard, J. Jackson, *Argonne National Laboratory, USA*

Performance Improvement of Extended Air Defense Testbed (EADTB) Via Synchronous Parallel Environment for Emulation and Discrete Event Simulation (SPEEDES) Retrofit

Ray Smith, J. Rinkel, *TRW, USA*

M. Parsons, *U.S. Army Space and Missile Defense Command, USA*

A. Morris, *Kottmann, USA*

The Testing of Distributed Real-Time System

Hua-ping Hu, *National University of Defense Technology, China*

Session 7: Simulation Applications

Chair: Srin Ramaswamy

Implementation and Evaluation of a Distributed Interactive Simulation Architecture for Group Interaction and Coordination: A Case Study in Interference Detection and Resolution in Naval Radar Units

Srinivasan Ramaswamy, K. Srinivasan, *Tennessee Technological University, USA*

Wargame 2000 Architecture Overview

Virtual Proving Ground Integration

K. Hall, *AMTEC Corporation, USA*

Simulation System Life-Cycle Evolution

Chair: Captain Joseph Celano, *US Navy/SPAWAR*

Co-Chair: Jeffrey W. Wallace, *Epsilon Systems Solutions, Inc.*

Session 1: State of the Practice in Modeling and Simulation

PANDA: Simulation Interoperability Through Software Engineering

Capt. Joseph Celano, *US Navy/SPAWAR, USA*

Jeffrey Wallace, *Epsilon Systems Solutions, USA*

Integrating SPEEDES into the JMASS Architecture

Jeffrey Wallace, *Epsilon Systems Solutions, USA*

Robert McGraw, *RAM Laboratories, USA*

Joint Simulation System (JSIMS) Technical Update

Fred Hartman, *DMSO, USA*

Session 2: Simulation Development Environments

OSim - Integrating Simulation Across the E-Engineering

Carl Byers, *Original Sim, USA*

Sequoia

Jean-Marc Naud, *Virtual Prototypes, Inc, USA*

A Signal Representation Framework for the Heterogeneous Simulation of Optical Components, Systems and Networks

Olaf Lenzmann, *Virtual Photomill, Inc., USA*

Session 3: Modeling Development Environments

Reconfigurable Models: A Modeling Paradigm to Support Simulation-Based Design

Antonio Diaz-Calderon, *Carnegie Mellon University, USA*

Modeling the Web: Linking Discrete and Continuous

Narsingh Deo, *University of Central Florida, USA*

Building a Network Simulator Using Distributed Object Technology

Dimitrios Vergados, *National Technical University of Athens, Greece*

Session 4: Simulation Life-Cycle Management

Naval Aviation Training Systems, Interoperability Maturation Model

Capt. Rory Fisher, *NAVAIR*

Daniel Paterson Paterson, *NAWCTSD*

SEI CMM and its Relationship to Verification and Validation

Candace Conwell, *SPAWAR, USA*

Performance Evaluation of Communication Systems Using Formal Description Techniques

Luc Hohwiller, *University of Mulhouse, France*

M&S for Lifecycle Management at Sandia National Laboratories: From Engineering Simulations to Enterprise Modeling

Pat Chavez, *Sandia National Labs, USA*

Session 5: The Future of Modeling and Simulation Development Practices

Revolution in Engineering and Manufacturing (REM)

Russel D. Skocypec, *Sandia National Labs, USA*

Distributed Modeling and Simulation for Virtual Enterprises

Erkollar, Alptekin, *University of Klagenfurt, Austria*

Simulation Based Acquisition - Producing Savings is Key

William Grigson, *IITRI, USA*

Controlling and Understanding Simulation Significance

Chair: Simone Youngblood

Accreditation: What It Is and What It Isn't

Beth Vann, K. Kawano, *AEgis Technologies Group, Inc., USA*

J. Pate, *System Test & Evaluation Directorate, USA*

An Expert Model of Simulation Statistical Analysis Customized for Simulation Beginners

Yu-hui Tao, S. Guo, *I-Shou University, Taiwan*

Dynamic Model-Based Management of Export Supply Chains

Douglas Seeley, *Emerging Networks, Inc., Canada*

R.D. Bridges, R. Macri, A.J. Griffith, *InterDynamics, Pty. Ltd., Australia*

Joint Electronic Combat Using Simulation (JECSIM) Joint Test and Evaluation (JT&E) Extension Analysis

James Kirkland, *CSC Nichols, USA*

An Integrated Approach to Evaluating Simulation Credibility

Paul Muessig, *Naval Air Warfare Center, USA*

D.R. Laack, J. Wroblewski, *Computer Sciences Corporation, USA*

Simulation Conceptual Model Issues: Development MethodsDale Pace, *The Johns Hopkins University Applied Physics Laboratory, USA***Verification & Validation of the Joint Warfare System (JWARS) Conceptual Model**Michael Metz, *Innovative Management Concepts, Inc., USA***Software Engineering and Simulation Credibility**Ronald Ketcham, *NAWC-WD, USA***Anchoring Methodology of the National Missile Defense (NMD) Integrated System Test Capability (ISTC): Correlating Flight and Ground Test Data**Alleen Bray, A.W. Bray, *AEgis Technologies, USA*M.L. Phillips, *Boeing North America, USA***Focusing on Credibility and Confidence - U.S. Navy Modeling and Simulation Verification, Validation and Accreditation**C.L. Conwell, *US Navy/SPAWAR, USA*B.J. Hall, *US Navy Commander Operational Test and Evaluation Force, USA*Marcia Stutzman, *Logicon Information Systems & Services, USA***Introduction to the Verification, Validation and Accreditation (VV&A) Process Turbo Tool**Jean Graffagnini, *AEgis Technologies Group, USA*C. Conwell, *OPNAV, USA***M&S Qualification: An Incremental Approach to VV&A**Joseph Uzdziński, J. Shelby, *Systems Planning & Analysis, USA*C.A. Miller, *Navy Area TBMD Program, USA*M. Lee, *Navy Theater Wide TBMD Program, USA*E. Sutter, *Lockheed Martin/SE&I, USA***VV&A of the Simulated Natural Environment**Virginia Dobey, *Acton Burnell, Inc., USA***Conceptual Modelling for Distributed Simulation Using Soft Systems Methodology**Richard Watson, *DSTO, Australia***Knowledge Acquisition for Simulation Requirements: Resolving Ambiguity the CMMS-DD Way**Ronald Smits, Bruce Harris, *Dynamics Research Corporation, USA***SIMULATION APPLICATIONS****Application Domains Synopsis****Chair: Steve Chambers**

This track seeks to (1) Identify salient characteristics of modeling and simulation in apparent disparate application domains and (2) Discriminate similarities and differences across these domains and increase opportunities for sharing concepts, tools and practices across such diverse domains for the collective advantage of the simulation industry.

A Simulation Study on the Design of a Hybrid Production System Integrating KANBAN with MRPT.Y. Song, *NongShim Data System Co., Ltd., South Korea*K.T. Shin, *Daejin University, South Korea*Yangja J. Jang, J.W. Park, *Seoul National University, South Korea***Simulation-Based System Engineering****Chair: Greg Tackett**

Models and simulations have a long history as tools supporting the systems engineering process, but the relationship between the digital system representations used in the design process and those used in performance simulation has been mostly distant, and rarely automated. This track discusses the linkage of systems engineering tools and associated design data to modeling and simulation tools and associated performance data to support collaborative design and spiral development of systems, highlighting some approaches, examples, and issues.

Connecting People, Information, and Related Tools in an Evolving SIMTLC Collaborative Environment for Army Materiel Life Cycle ProcessesGrace Bochenek, K.J. Ciarelli, *US Army Tank-Automotive and Armaments Command, USA***Integrated Systems Engineering Process for Performing Life Cycle Cost Tradeoffs**William Ealy, G.W. Barnett, *Lockheed Martin, USA***Research on Supporting Environment Technology for Virtual Prototyping**Xudong Chai, G.L. Xiong, *Tsinghua University, China*B.H. Li, *University of Aeronautics and Astronautics, China***Next-Generation Architecture to Support Simulation-Based Acquisition of Complex Systems**Bipin Chadha, J.J. Welsh, *Lockheed Martin, USA***Collaborative Missile Design and Analysis**Greg Haynes, S. Speigle, *US Army, USA***Military Systems Simulation****Chairs: Jake Borah and Elizabeth Wells**

The Military Systems Simulation track will be comprised of defense/military systems, simulations, analysis tools, technology advancements, systems integration, etc. This area addresses simulation as it is applied in support of military needs. This area includes the following application domains: research, development and acquisition (RDA); training exercises and military operations (TEMO); and the particular characteristics of modeling and simulation (M&S) in the defense industry.

System of Systems Integration (SOSI) A "Smart" Way of Acquiring Army C4I2WS SystemsRichard Pei, *US Army Communications-Electronics Command, USA***TBMD in JWARS: How Much Detail is Appropriate?**Barry Mitchell, J.K. Telford, *The Johns Hopkins University, USA***Role of Hardware-in-the-Loop (HWIL) Simulation in the Production Process of an Air Defense Missile System**Miranda Oden, D. Curry, C. Combs, *US Army Aviation and Missile Command, USA***A Paradigm for Modeling Chemical, Biological and Smoke Effects Within a Constructive Simulation**Ursula Williams, *Lockheed Martin Information Systems, USA***Scripted Architecture: An Alternative Way to Build Defensive Missile System Simulations**Harold Sells, *DESE Research, Inc., USA***Weapons Design Analysis Using 1 Meter Terrain Resolution Battlefield Simulators**Wolfgang Baer, J. Illingworth, W. Kemple, B. Mansager, *Naval Postgraduate School, USA*

Interoperability Policy RoadmapPaul Sutton, *SPAWAR, USA***Advanced Command, Control and Communications (C3) Simulation and Analysis Using Extended Air Defense Testbed (EADTB)**Robert Hunter, *TRW, USA*S.D. Elliott, *Decisive Analytics Corporation, USA***A Comprehensive Simulation Platform for Intrusion Detection in Distributed Systems**S. Upadhyaya, K. Mantha, R. Chinchani, K. Kwiat, *SUNY-Buffalo, USA***Conceptual Modeling of Foreign Command Decision Processes**Kay Burnett, *National Ground Intelligence Center, USA*D. Timian, M.S. Tamuci, *Sterling Software, Inc., USA***Department of Defense Air and Space Natural Environment Modeling and Simulation Executive Agent: Supporting a Framework Ensuring Authoritative Representation of Environmental Data for Simulation**Mike Hunsucker, J.D. Liechty, *Air and Space Natural Environment**Modeling and Simulation Executive Agent, USA***Using XML to Share Non-Realtime Simulation Data**Lee Lacy, *Dynamics Research Corporation, USA*G. Pearman, T. Dugone, J. Jackson, *TRADOC Research, USA***The Incorporation of High Resolution Climatological Data to Support the Development of Environmental Tactical Decision Aids for the Warfighter**John Hummel, T.B. Baines, *Argonne National Laboratory, USA*M.S. Hunsucker, J.D. Lechty, *Office of the Air and Space Natural**Environment, USA***TARDEC'S Embedded Simulation System for Ground Vehicles**Sharon Chase, *Monmouth College, USA***Using Market Mechanisms to Simulate the Balancing of Supply and Demand for Fault-Tolerant Network Resources**Kevin Kwiat, *Air Force Research Laboratory, USA***Modeling Force Development from Army Installations Using the Transportation System Capability (TRANSCAP) Model**James Burke, R.J. Love, C.M. Macal, D.L. Howard, J. Jackson, *Argonne**National Laboratory, USA***A Reconfigurable Object Model for Port Operations**James Leathrum, T. Frith, *Old Dominion University, USA***Modeling Human Crew Member Behavior with Machine Learning Agents**Gene Peresich, M.L. Dittmar, *The Boeing Co., USA*J. Graffagnini, *AEgis Technology Group, USA***A HLA-Based Implementation of a Human Behaviour Agent Architecture**Jean Graffagnini, *AEgis Technologies Group, USA*G. Peresich, *The Boeing Company, USA***Overview of Multidimensional Model Reduction Techniques**Tom Karle, *Air Force Research Laboratory, USA***The Research of High-Precision and Real-Time Clutter Simulation for Airborne Pulse Doppler Radar**Z.H. Liang, Z.D. Jiang, *Xi'an Jiaotong University, China*X. Zhang, *The Luoyang Electronic-Optical Equipment Research Institute of**AVIC, China***Modeling and Simulation in Human Factors Engineering****Chair: S. Narayanan, *Wright State University****This session focuses on theoretical and applied perspectives of models and simulations in the context of human factors engineering. Topics include interactive simulations, human operator models, simulators, visualizations, training and tutoring aids for complex problems, and agent architectures for decision support. Several invited papers will be presented by academics and practitioners on these topics.***Matrix Architecture: A New Fuzzy Approach to Intelligent Agent Based Simulation/Modeling**Gerald Pitts, M. Chiu, *Trinity University, USA***Human Operator Models in Constructive Simulations: A Review**D.G. Hoagland, *Wright State University, USA*S. Narayanan, *Air Force Research Lab, USA***Domain-Relevant Performance Analysis in Human-in-the-Loop Discrete-Event Simulations**Ling Rothrock, *Wright State University, USA***Socio-Technical Model of Complexity, Ambiguity and Emergency in Team Situation Awareness**Tetsuo Sawaragi, K. Murasawa, *Kyoto University, Japan***A Conflict of Metaphors: Modeling the Planning Process**Michael Cox, *Wright State University, USA***Evaluation of Human Performance in a Simulated UCAV Control Station**Jennie Gallimore, J.R. Lucas, J.J. Gallimore, *Wright State University, USA***Transportation and Automotive Applications****Definition of Traffic Flow Rules in Atlas**Gabriel Wainer, A. Diaz, V. Vazquez, *Univ. de Buenos Aires, Argentina***Applications of PSPICE Can Simulator to Analyze Effects of Emissions from Automotive Data Busses**Andrew Rusek, *Oakland University, USA*D. Stevens, *DaimlerChrysler, USA*H. Catherino, *TACOM, USA***Dynamic Simulation of DKM Models of Robotized Shovel for Surface Mining**Samuel Frimpong, R.M. Changirwa, J.K. Szymanski, C. Meng, *University of Alberta, Canada***ELIST: A Simulation System for Transportation Logistics Planning Support**

Mary Braun, G.R. Lurie, K.L. Simunich, C.N. Van Groningen, H.J. Vander

Zee, M.A. Widing, *Argonne National Laboratory, USA***Behavioral Modeling of Thermodynamic and Other Non-Electrical Systems**Michael Tiller, C. Newman, N. Trigui, *Ford Motor Company, USA***A Prototype Model for Traffic Networks**Tai-Chi Lee, *Saginaw Valley State University, USA***FACET: A Simulation Software Framework for Modeling Complex Societal Processes and Interactions**John Christiansen, *Argonne National Laboratory, USA***HLA Simulator for Land Based Transportation**Dietmar Moeller, *University of Hamburg, Germany*H. Popescu, *McLeod Institute of Simulation Sciences, Germany*

Medical and Pharmaceutical Applications

Chair: J. Mailen Kootsey

Session 1: Issues on Whole Body Modeling

Chair: J. Mailen Kootsey, *Loma Linda University*

Validation of the Human Muscle Model

Ales Belic, N. Knez, R. Karba, V. Valencic, *Faculty of Electrical Engineering, Slovenia*

An Environment for the Compartmental Modeling and Simulation in Biology and Medicine

Y. Hamam, F. Rocaries, N. Natowicz, *ESIEE Noisy le Grand CEDEX, France*

A Learning Based Stochastic Modeling Approach for Clinical Diagnosis

Yskandar Hamam, T. Al Ani, Y. Hamam, *Noisy le Grand CEDEX, France*

Cascaded Neural Network for Classification of Artificially Modeled ECG Beats Using Error Signal

Raed Zitar, *Al-Isra University, Jordan*

Strategies for Large Scale Modeling in the Physiome Project

James B. Bassingthwaighe, Z. Li, *University of Washington-Seattle, USA*

Session 2: Existing and Projected M&S Technologies

Chair: J. Mailen Kootsey, *Loma Linda University*

Modeling and Simulation of Neurological Dynamics with Symbolic Structures (MINDSS)

Troy Kelley, *Army Research Laboratory, USA*

GOLEM – Medical Multimedia Training Simulator of Body Fluids and Acid-Base Disorders

Jiri Kofránek, T. Velan, P. Janicadis, *Charles University, Czech Republic*

Whole Body Modeling

J. Kootsey, *Loma Linda University, USA*

Computational Issues in Modeling a Hierarchical Biological System

J. Mailen Kootsey, *Loma Linda University, USA*

Reconfigurable Distributed Simulation Engine for Multiple Uses

Capt. Joe Celano, *US Navy-SPAWAR, USA*

Session 3: Whole Body Modeling – Panel

Chair: J. Mailen Kootsey, *Loma Linda University*

Jim Bassingthwaighe, *University of Washington, USA*

Capt. Joe Celano, John Silva, *US Navy-SPAWAR, USA*

Science & Engineering

Session 1: Communications

A New Approach to Adaptive Morse Code Recognition

Cheng-Hong Yang, *National Kaohsiung Institute of Technology, Taiwan*

The Computational Reduction and Performance Evaluation for the Simulation of Fading Communications Channels

Yunxin Li, Y.X. Li, X.J. Huang, *Motorola Labs, Australia*

A Novel Voice-Over-ATM Interface Simulation

M. Jahromi, H.S. Al-Raweshidy, L. Peil, *Univ. of Kent at Canterbury, UK*

A Novel Management Model for Distributing the Bandwidth Available Over Active Connections

Masaud Jahromi, H.S. Al-Raweshidy, *University of Kent at Canterbury, UK*

Parallel Discrete-Event Simulation of Internet Telephony

Phillip Dickens, V.K. Gurhani, *Illinois Instit. of Technology-Chicago, USA*

Session 2: Geological Science

Hydrodynamic Modeling and Simulation of Oil Sands Slurry Flow in Flexible Pipelines

Samuel Frimpong, M. Meng, R. Changirwa, *University of Alberta, Canada*

Global Model for Retracing U-Exchange Between Fossil Mollusk Shells and Their Surrounding Environments

Semghouli Slimane, R. Cherkaoui, *University Mohammed-V, Morocco*
A. Choukri, M. Dahmani, E. Jahjouch, *University Ibn Tofail, Morocco*

Session 3: Manufacturing

The Construction of Production Planning and Scheduling System for an IC Foundry in Ramp-Up Period

Shu Hsing Chung, Y.C. Su, J.S. Liao, A.Y. Chen, *National Chiao Tung University, Taiwan*

H.Y. Lee, *Chung-Hua University, Taiwan*

A Deadlock Avoidance and Scheduling Algorithm for Simulation of Product Flow in a Flexible Manufacturing System

Robert Lipset, R.P. Judd, P. Deering, *Ohio University, USA*

Simulation Methodology for Testing Defects in Materials

Mohammad Obaidat, *Monmouth University, USA*

M.A. Suhail, *KFUPM Dhahran, Saudi Arabia*

B.I. Sadoun, *Applied Science University, Jordan*

Modeling Factory Logistics

Abe Nisanci, *Bradley University, USA*

Broadband Heterogeneous Network Design Based on Simulated Annealing Algorithms

Miguel Rios, V. Marianov, C. Abaroa, *Universidad Catolica de Chile, Chile*

Session 4: Electrical and Electrical Engineering

System Dynamics Simulation Modelling and Optimisation of the Polyphase Induction Motor

Ante Munitic, L. Milic, M. Bupic, *University of Split, Croatia*

Enterprise & Organizational Simulation

Chair: Joseph Barjis, Tom Mastaglio

Organizational Simulation provides a reconsidering of existing business processes and existing organizational structures to determine what opportunities exist for improving efficiency and effectiveness within an organization, to make business cheaper, faster and more reliable. organizational simulation plays a crucial role when optimizing organizational design by analyzing the results of organizational simulation. Organizations and their business processes are too complex and dynamic to be understood and analyzed by flowcharting and spreadsheets alone. Sometimes organizations of competing/cooperating economic entities can exhibit surprising behavior. Simulation can identify that behavior and suggest solutions before it becomes very expensive to fix it. Herein lies the opportunity for organizations (companies) to institutionalize simulation as a standard tool for BPR. Simulation is the only tool that can provide both accurate analysis and visualization of alternatives. It allows for comparison of various models of business processes for optimization and best performance characteristics.

A Simulation Methodology for Investigating Business Processes in Small Companies

Joseph Barjis, *Delft University of Technology, Netherlands*

I. Barji, *International Center of Information Amersfoort, Netherlands*

R. Dokht, D. Chitchian, *Electro-Medics International, Netherlands*

Analysis in Support of a "Herd of Felines:" Simulation, Outcome Measurement, & Pluralistic Decision-Making

Desmond Saunders-Newton, *University of Southern California, USA*

Simulation of Organizational Processes Combining Semantic Analysis and Petri Nets

Joseph Barjis, *Delft University of Technology, Netherlands*
 J. Filipe, *Polytechnic Institute of Setubal, Portugal*

Intelligence Simulation in Organization Design

George Goshev, *University of National and World Economy, Bulgaria*

Integrating Business Process Modeling and Simulation

Joseph Barjis, I.G. Ilkov, *Delft University of Technology, Netherlands*

Organizational Simulation: Concepts and Application

Joseph Barjis, J. Dietz, *Delft University of Technology, Netherlands*
 L. Groenewegen, *Leiden University, Netherlands*

Applying Business Objects for Simulation

Joseph Barjis, M. Abolhassani, *Delft University of Technology, Netherlands*

An Approach to Simulating ICT Management Processes

Ilian Ilkov, M. Looijen, *Delft University of Technology, Netherlands*

Lean Enterprise Simulations

H. Czarnecki, M. Adams, *University of Alabama in Huntsville, USA*
 Bernard Schroer, *Summa Technology Inc., USA*

Using Enterprise Simulation to Support SATS

Thomas Mastaglio, *Virginia Modeling, Analysis and Simulation Center, USA*
 R. Mielke, *Old Dominion University, USA*

Negotiating Electronic Commerce: An Empirical Examination of the Effects of Negotiation Support System and Electronic Bargaining Agents in a Web Environment

Haixin Wu, L. Wang, *National University of Singapore, Singapore*

SIMULATION INDUSTRY AND BUSINESS PRACTICES**Simulation on the National Agenda**

Chair: Vince Amico

Session 1: The Future in the World of Simulation

Chairs: Lee Lacy, Brian Goldiez

In the future, simulation will become increasingly "mainstream." This session focuses on how simulation will be used in the future in all areas of society. Presentations in this session will predict what simulation technologies and applications will be developed and applied in the next millennium.

Invited Participants:

Steve (Flash) Gordon, *Air Force Agency for M&S*
 Bill Harris, *NAWC-TSD*
 Bob Sottolare, *STRICOM*
 John Latta, *Private Consultant and Publisher 4th Wave*
 Sheila Banks, *Private Consultant*
 Frank Cardullo, *SUNY Binghamton*
 Roy Latham, *CGSD*
 Mark Yerkes, *UCF*
 Jack Thorpe, *SAIC*

Session 2: Research Issues in Simulation Technology

Chair: Ratan Guha

The intent here is to identify and address a number of the critical research areas where current technology, hardware and software are not capable of meeting stated simulation objectives. Stated in another way, what are the three to five challenges in simulation research.

Critical Issues in Simulation

Vince Amico, R. Guha, *University of Central Florida, USA*
 A.G. Bruzzone, *Universita degli Studi di Genova, Italy*

Simulation Conceptual Models: Impact on Simulation Development Costs and V&V Costs

Dale Pace, *JHUAPL*

A Frame for Validation of Simulation Models

Helena Szczerbicka, *University of Hanover, Germany*

Session 3: Simulation in Entertainment

Chairs: Hank Okraski, Brian Goldiez

The entertainment industry is becoming a primary user of simulation technology in developing movies, theme park attractions and interactive games. This session explores applications of computer science, art and simulation to the entertainment industry.

Physics, Communication Theory and the Interactive World of Experience-Based Entertainment and Simulation

Priscilla Elfrey, *NASA, USA*

Does Simulation Need a Reality Check?

William Swartout, R. Lindheim, *USC, USA*

NPS Moves - Entertainment Research Directions

Michael Zyda, *Naval Postgraduate School, USA*

Entity Simulation in Realtime Strategy Games

Dave Pottinger, *University of Arizona, USA*

Putting the Stimulation in Simulation, the Convergence of Media in Creating Compelling Simulations for Entertainment and Education

Christopher Stapleton, *University of Central Florida, USA*

Exploitation of the Game Industry by Defense

Mark McAuliffe, A.M. Paschal, *STRICOM, USA*

Influences of Communications and Media

Chairs: John Illgen, Dave Gledhill, *Illgen Simulation Technologies*

Session 1: California High Technology M&S Consortium

Chair: J.D. Illgen, *Illgen Simulation Technologies*

Economics of Combat Vehicle Simulation

Ron Duvall, *ART, USA*

IT Technologies

Tom Strellich, *ISTI, USA*

Animation and Graphics

Bo Hayner, *USA*

Behavior Modeling (Where Are We Going/Economics of Scale)

Bob Chamberlain, *Bob Hennessey, USA*

Aerodynamics / Testing (The Future)

Roger Hoh, *USA*

Scemarop Generation

Terry Turpin, *USA*

Secure Real Time Speech Transmission Over the Internet: Performance Analysis and Simulation

Marco Rocchetti, *University of Bologna, Italy*

Panel Session**Simulation Marketplace – Economics of Scale**

Panelists: Bob Chamberlain, Chair
 Consortium Members

Panel Session**Internet Influence on Simulation – A Technological, Economical, and Marketing Perspective**

Panelists: John D. Illgen, Chair

Warren Katz

Phil Abold

Michael Macedonia

Sam Savage

David Gledhill

Education and Training

Chairs: Hessam Sarjoughian, Vince Amico, Lou Birta

Session 1: Perspectives on M&S Education Training

Chair: Hessam Sarjoughian

This session discusses the state of education and training as was represented in two workshops with participants from government, industry and academia.

Presenters: Ralph Rogers, *Old Dominion University*

William Yurcik

William Tucker, *The Boeing Corporation*

Session 2: Requirements for Education and Training of M&S Professionals

Chair: Lou Birta

This session addresses the perceived needs, requirements and opportunities within the employment community for training of simulation professionals. The speakers are solicited to report their own experiences in recruiting, hiring, training and retaining simulation professionals, and will address the general set of requirements for employee training support by educational institutions and commercial professional delivery agencies.

Presenters: John Illgen, *Illgen Simulation Technologies*

Joseph Gauthier, *AEgis Technologies Group*

Session 3: Academic Curricula for M&S Professionals- Existing Programs and Trends

Chair: Vince Amico, *University of Central Florida*

This session consists of reports from representatives of academic institutions providing simulation degrees or degree concentration. Speakers are solicited from academic institutions to report their own curricula and to comment upon the issues and strategies for curricular development and the conduct of simulation-oriented degree programs.

Presenters: Richard Fujimoto, *Georgia Institute of Technology*

Michael Zyda, *Naval Post Graduate School*

Ralph Rogers, *Old Dominion University*

Bernard Zeigler, *University of Arizona*

Roy Crosbie, *University of California-Chico*

Kent Williams, *University of Central Florida*

Session 4: Commercial Professional Development Training for M&S

Chair: Mike Lightner, *AEgis Technologies Group*

This session consists of reports from commercial organizations which deliver modeling and simulation professional development training. Speakers will report their institutional approaches to simulation, professional development, training, market analysis, course material development, and marketing, sales and distribution.

Session 5: Issues and Opportunities for Professional Development for M&S-Panel

Chair: Hessam Sarjoughian, *University of Arizona*

This panel consists of a discussion on the degree to which the needs for simulation technical education and professional development are met by existing service providers. Panelists will consider how the needs of employers and simulation professionals for simulation training can best be met, and will explore opportunities for constructive collaboration among educational providers, consumers and market facilitization agents.

Panelists: Roy Crosbie, John Zenor, Ralph Rogers, Bob Strini, Bill Waite, Bernard Zeigler

Using Simulation to Assign Agricultural Machinery in Michoacan, Mexico

Enrique Arjona-Suarez, E. Bueno, *Colegio de Postgraduados, Mexico*

J. Martinez-Cristobal, *Universidad Tecnologica de Mexico, Mexico*

HLA: A Progress Report on the University Outreach Program

Roy E. Crosbie, *California State University-Chico, USA*

J. Zenor, *SAIC, USA*

Economics of Modeling and Simulation

Chairs: Pat Cannon, *AEgis Technologies Group*

The Economics of Modeling and Simulation track will focus on developing coherent understanding of how the modeling and simulation community and its proponents can use the language and processes of economics to articulate the costs and benefits of M&S and thereby justify the existence of M&S as part of the overall business practice of an organization. The rationale for this approach is that M&S competes with other activities in any organization for resources and that M&S practitioners must be cognizant of how to articulate their reasons for existence in the context of the overall organization.

Session 1: Collegial Initiative on the Economics of Modeling and Simulation—A Status Report

Chair: Bill Waite, *AEgis Technologies Group*

Session 2: Economic Implications of Standards for M&S - Panel

Chair: Peggy Gravitz, *IITRI*

Session 3: Economics of M&S in DoD Services**Session 4: Economic Considerations in Managing Simulation Assets**

Chair: Jackie Steele

Simulation Conceptual Model Issues: Impact on Simulation Development Costs and V&V Costs

Dale Pace, *The Johns Hopkins University Applied Physics Laboratory, USA*

Economics of M&S

Michael P. Bailey

Determining the Value of Simulation**Managing Modeling and Simulation as a Single Program**

W.A. Watkins, *Computer Science Corp., USA*

Carol Booth, *Dynamics Research Corp., USA*

Determining the Value of Simulation

Steven Gordon, *Air Force Agency for M&S, USA*



The Society for Computer Simulation International

**2000 SUMMER COMPUTER SIMULATION CONFERENCE &
2000 SYMPOSIUM ON PERFORMANCE AND EVALUATION OF
COMPUTER AND TELECOMMUNICATION SYSTEMS**

July 16-20, 2000

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 One bed (king) Two beds (double)

Room Rate: Standard Room: \$160/\$180 (Canadian Dollars)
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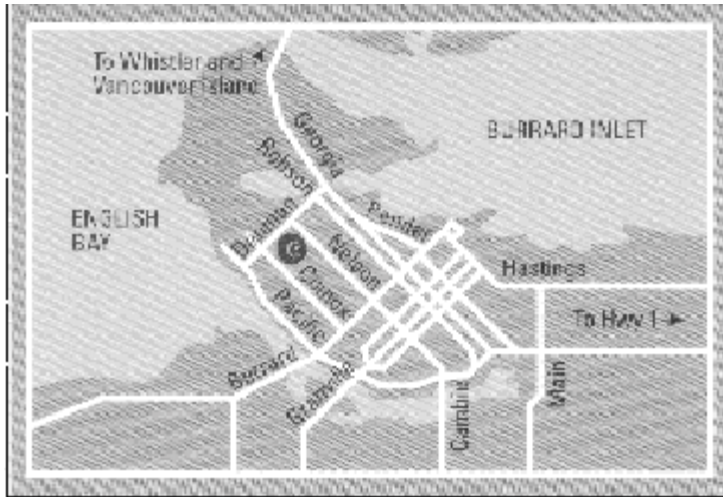
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Venue Information

On Canada's west coast, nestled between rugged mountains and the brilliant blue Pacific Ocean, you'll find a city that defies categorization. Greater Vancouver. A total unique blend of cosmopolitan amenities, natural splendors and cultural attractions, a highly entertaining city to say the least. Greater Vancouver's scenery is unmatched, as are its recreational opportunities. In short, there is no easy way to describe Vancouver, you've just got to see it for yourself.

Directions

From U.S. and Canadian Border:

Follow I-5 to the border, it becomes Hwy. 99 when you cross into Canada. Continue on Hwy. 99 through the Massey Tunnel and over the Oak St. Bridge. Take Oak St. to 12th Ave. and turn left. Turn right onto Granville St. and go over the Granville St. Bridge. At the end of the bridge (second set of traffic lights), turn left onto Davie St. Take Davie all the way to Denman St. and turn right. Come down two blocks and turn right on Comox St. The hotel will be on your left.

From Highway #1:

Take the Grandview exit off Highway #1. Take Grandview Highway (which becomes 12th Avenue) all the way to Granville St., turn right and follow over the Granville St. Bridge. At the second set of traffic lights at the end of the bridge, turn left onto Davie St. Take Davie all the way to Denman St. and turn right. Come down two blocks and turn right onto Comox St. The hotel will be on your left.

From the Airport:

Exit airport via Author Laing Bridge. Take City Center (Granville St.) exit and follow Granville St. over the Granville St. Bridge. At the end of the bridge (second set of lights), turn left onto Davie St. Take Davie all the way to Denman St. and turn right. Come down two blocks and turn right on Comox St. The hotel will be on your left.

Public Transportation to The Coast Plaza Suite Hotel

Airport Shuttle

\$11 (Canadian) one way, \$18 round trip.

Taxi

\$30 (Canadian) one way

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