

# 2003 SUMMER SIMULATION MULTICONFERENCE



Sponsored By The Society For  
Modeling and Simulation International

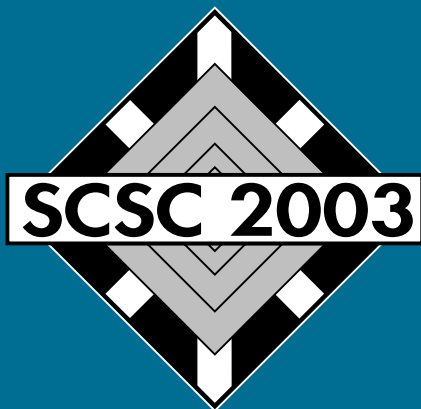


July 20–24, 2003 • Montreal, Quebec, Canada

Summer Computer  
Simulation Conference

International Symposium  
on Performance Evaluation  
of Computer and  
Telecommunication Systems

International Conference  
on Information Systems  
and Engineering



GENERAL CHAIR:  
AGOSTINO G. BRUZZONE,  
UNIVERSITY OF GENOA  
AGOSTINO@ITIM.UNIGE.IT



GENERAL CHAIR:  
MOHAMMAD S. OBADAT,  
MONMOUTH UNIVERSITY  
OBADAT@MONMOUTH.EDU



GENERAL CHAIR:  
WALEED SMARI,  
UNIVERSITY OF DAYTON  
WALEED.SMARI@NOTES.UDAYTON.EDU

## Summer SiMC 2003 Steering Committee Chair's Message

Welcome to the 2003 Summer Simulation Multiconference. This year's conference marks the 34th anniversary of the Summer SiMC that started in 1969 with the name, "Conference on Applications of Continuous System Languages," which was held between June 30 and July 1, 1969 in San Francisco. In 1970, the name of the conference was changed to "Summer Computer Simulation Conference, SCSC." The latter name has been used since then.

SCS conferences and publications are undergoing major restructuring in order to best serve the profession, participants, and society members. Since July 2002, we have been working to restructure our three major multiconferences to make them more appealing and rewarding to their participants and at the same time economically viable to the society. We have two goals for our conferences: short-term and long-term goals. In order to meet our short term goals, we have put in place a new conference structure and a new fee structure. The new structure is more systematic and appealing to participants and at the same time has the potential to cut unnecessary expenses and increase the revenues for the society. In order to achieve the long term goals, we have formed a conference advisory panel that is composed of well known scientists, key organizers of our three major conferences, representatives from SCS European conferences and SCS executive director to study the current structure of our conferences and suggest ways by which we can restructure our conference offerings to make them more coherent, more systematic, content organized (not necessarily by region or by season), attractive to outsiders, predictable, uniform, streamlined as much as possible. Also, the panel is expected to suggest ways to stimulate the new technical councils to run workshops, symposia, and conferences, among others.

The advisory panel had a fruitful meeting on March 31, 2003 in Orlando during the ASTC2003 (Spring SiMC2003). A second meeting of the advisory panel is planned for July 2003 in Montreal during Summer SiMC2003. I would like to report that the initial results of the restructuring seem to be very encouraging. Many thanks to the conference advisory panel members for their constructive suggestions and dedicated efforts.

Summer SiMC2003 consists of three conferences: the 2003 International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS2003), 2003 Summer Computer Simulation Conference (SCSC2003), and the newly added 2003 International Conference on Information and System



Mohammad S. Obaidat  
Steering Committee Chair,  
Summer SiMC2003

Engineering (ISE2003). The program committees of Summer SiMC2003 have accepted over 320 papers from all over the world. This multiconference is a unique setting where an author can submit papers to basically three different conferences that convene in the same place and during the same period. In addition to the stimulating environment, this multiconference has an economical attraction, as it saves a lot of expenses for the participants, presenters, and exhibitors, as well as the organizers

Summer SiMC2003 offers a unique forum for researchers and practitioners from academia, industry, business, and government to share their expertise results and research findings in all areas of modeling and simulation, performance evaluation of computer and telecommunications systems, and information and system engineering.

This year's conference includes a superb technical program, four distinguished keynote speakers, insightful tutorials, and an exhibit. We have chosen the Wyndham Montreal Hotel, Montreal, Canada, as a site for our conference. The hotel provides excellent meeting facilities and will be a comfortable setting for our multiconference. The City of Montreal is rich in its cultural and many touristic attractions.

Organizing an international conference of this caliber requires the dedication and hard work of many individuals. My sincere appreciation goes to all authors including those whose papers were not included in the program. Many thanks go to the technical program committee members and their reviewers, international liaisons, session chairs, and the dedicated efforts of the Summer SiMC executive and steering committees. Special thanks go to the general chairs, vice chairs, tutorial chairs, exhibit chair, web masters, and publicity committee. Thanks are also due to the staff of the Society for Modeling and Simulation International, SCS, for their fine support.

Finally, on behalf of the Executive and Steering Committees of the 2003 Summer Simulation Multiconference (Summer SiMC2003), and the Society for Modeling and Simulation International, SCS, I invite all of you to enjoy the conference and your stay in the beautiful city of Montreal.

## SCSC 2003 General Chair's Message

Welcome to the 2003 Summer Computer Simulation Conference, SCSC2003. This year the conference is being held at a very dynamic time in which Simulation is being offered new opportunities for successful development. Montreal is the ideal framework for organizing SCSC2003 since it offers a truly balanced mix between North America and Europe in the Canadian summertime. SCSC2003 allows the international simulation community to present the current advances and innovative concepts in M&S (Modeling and Simulation) in a city where major research centers, universities and leading companies are playing a very active role in this specific sector. Such interaction is a very critical issue for guaranteeing that M&S will continue to remain up-to-date with respect to new challenges. In effect, the worldwide situation is providing a "brave new world" of issues where solutions that are "right the first time" are mandatory. Simulation results are often the only affordable means of approaching such issues. However, strong efforts to divulge such concepts as well as the proper background to ensure the effective application of M&S are still required. SCS International itself is changing, while all of us feel that the spirit of John McLeod remains a cornerstone for providing the proper support for this evolution. Today, simulation needs to get back to real problem-solving by using the latest techniques, proper technology and strong fundamentals. Such factors are needed to guarantee that models can be effectively applied, with quantitative understanding of the relative potential, limitations, fidelity and tolerances. The success of the SCSC is based on its ability to create a forum for academia, industry, business, and government covering a wide variety of disciplines and domains that utilize M&S technology to present their work in a unique setting. Through the SCSC, participants can share their expertise, results, and achievements in all areas of M&S technology. In the future it will be critical for the SCSC to become a point of departure for starting new initiatives and cooperative efforts in order to promote new innovative projects in this area. SCSC2003 focused much attention on the concept of quality. In fact, we forced contributors to go through an extensive and detailed review process not only in terms of selection, but in particular to correct and improve the manuscripts. Over 230 full papers and extended abstracts were submitted for publication and at least three reviewers provided a detailed report of each paper, including detailed suggestions and notes to authors. 70% of submissions passed the final review - a significantly high percentage owing to the improvement process. Such a process also involved exceptional motivation and strong efforts by the IPC (International Program Committee). SCSC2003 includes tracks involving different methodological aspects and application areas. This year, however, along with the traditional



**Agostino Bruzzone**  
General Chair, SCSC 2003  
MISS, DIP,

program, we also added workshops as events for promoting discussion and cooperative activities. New Technical Councils have in fact been established and SCSC2003 is an ideal opportunity to create a meeting point for SIMPLEST (Technical Council in SIMulation applications in Management, PLanning & Forecasting). The LESNEX workshop (Lean Simulation Network), an initiative presented to European Community and now open for worldwide cooperation, is an attempt to network new M&S techniques. The Standards workshop is becoming a traditional event during major Simulation Conferences and such a mix of panel discussions and paper presentations during SCSC2003 provides a reference with regard to the recent and rapid evolution in this area. Last, but not least, the Student Workshop can be considered a major step forward for SCS International: new blood in this area is a must. That's because young people are the future of simulation, not only in terms of the scientists carrying out specific research in this area, but mostly with regard to users who are aware of the potential and the requirements for successfully applying M&S. Many individuals have contributed to the success of this truly international conference. My sincere appreciation goes to all authors, technical program committee members and their reviewers, international liaisons, as well as track and session chairs. Special thanks go to the Program Chair Mhamed Itmi, to Track Chairs and the IPC: V.Amico, F.Barros, L.Birta, M.Brandolini, C.Briano, P.Broas, J.P.Celano, J.M.Couretas, M.Den Hengst, C.L. dos Santos, P.Elfrey, A.Elkamel, A.El Hami, A.El Moudni, C.Frasson, S.Frimpong, C.Frydman, N.Giambiasi, A.Guash, D.Hill, V.Hlupic, R.Huntsinger, P.Kropf, R.Lutz, J.Hopkins, R.McGraw, P.Gravitz, R.Mosca, T.Ören, A.Orsoni, M.Piera, S.Raczynski, E.Radwan, R.Revetria, C.Roberts, L.Rothrock, S.Saetta, H.Sarjoughian, R.Signorile, R.Strini, S.Swenson, H.Szczerbicka, J.Uzdziński, G.Wainer, J.Wallace, E.Waller, F.Wieland, E.Williams, S.Youngblood and A.Zini. I would also like to acknowledge the important work by M. Massei and M. Chinni in SCSC2003 web management and the SCS International Office for their prompt reactions, and namely: S.Branch, S.Odegaard, M.Yen, and S.LaFlair. Finally, I invite all of you to join us in July in Montreal and endeavor to improve the worldwide use of Advanced Simulation.



**Monday, July 21, 2003, 8:30 am**

## **The Challenge of Building the Joint Simulation System**

**Laura Knight, *Joint Simulation Alliance Executive, SES-2***

The Joint Simulation System (JSIMS) is the newest constructive simulation designed to train military commanders and their staffs. It is developed by nine partners including the Military Services and Department of Defense Agencies. This Acquisition Category 1D (ACAT-1D) program is managed by the Army-led JSIMS Program Office with technical direction and integration performed by the Alliance Executive Office. JSIMS represents the most challenging modeling and simulation program in the history of the Department of Defense, from both a technical and a management perspective.

JSIMS provides an environment for commanders and their staffs (the training audience) to exercise their warfighting skills in a training environment similar to what they would find in real conflict, with realistic friendly and opposing forces, and real-world command and control systems. JSIMS delivered Block 1 for joint training applications and is preparing for the system verification and validation test to be conducted in Fall 2003.

The JSIMS program employs common components to meet the specified operational requirement. The high-level architecture (HLA) standard successfully running with the Defense Modeling and Simulation Office Run-time Infrastructure (RTI) dispels a number of technical myths regarding the RTI implementation and performance in a large-scale federation. A common simulation engine based upon the Synchronous Parallel Environment for Emulation and Discrete Event Simulation (SPEEDES) architecture supports many of the JSIMS federates, and has paved the way for use of a common simulation engine to support multiple, distinct federate needs. The enhanced HLA Technical Control commercial-off-the-shelf system controls federation operations and provides the user with efficient management at initialization and runtime. A complex security solution implementing auditing, common infrastructure layers guards between enclaves operating at different security levels and digital signatures provides security never before implemented in constructive simulation systems. This unique security solution potentially provides a model for future systems in our increasingly interconnected world. Finally, the significant development of a standard workstation employing common features such as database, scenario generation, after-action review system, and graphical user interface significantly enhances the useability of the system for the warfighter and trainer.

The technical successes of JSIMS Block 1 are a significant step forward for the modeling and simulation community. Getting there was not without other challenges. The management structure under which JSIMS was developed was touted by many as a recipe for disaster and one that could not be successful. These statements have an element of truth and while JSIMS succeeded in delivering the first block of software, the management challenges continue and the program faces an uncertain future. The lessons that can

and should be learned and applied from this experience will be explored. JSIMS remains a key element in training transformation and the possibilities are vast. The JSIMS vision remains full of possibilities but will require fundamental changes in the way we acquire the capability and structure the program.

### **Bio:**

Laura Knight was born and raised in Ridgecrest, California. She attended college at San Diego State University where she was granted a Bachelor of Science Degree in Mathematics in 1983 and a Master of Science Degree in Applied Mathematics in 1989.

In June 1983, Ms. Knight began her civil service career at the Naval Ocean Systems Center, San Diego, California. Her 17 years at the Center (now Space and Naval Warfare Systems Center San Diego) were spent largely in the area of Modeling and Simulation. She began career as a member of the Systems Planning and Analysis staff, principally focused in the area of anti-submarine warfare. In 1985 she served as the Project Manager for a Tactical Development and Evaluation project to develop tactics for maritime patrol aircraft operating in the marginal ice zone. While in this office, she began supporting the Naval War College Global Wargame and Technology Initiatives Game as an analyst.

In 1988 she began working as a program manager in the Research, Evaluation and Systems Analysis (RESA) Simulation program office. While in the RESA program office she served as program manager for a variety of research and development efforts including Submarine Laser Communications analysis efforts, Air Defense Initiative Concept of Operations Exercises, and a variety of test and evaluation related simulation programs. She also helped to initiate and conduct educational/advanced technology seminar war games for senior management using RESA. In 1993 she was appointed as the Technical Direction Agent for the Enhanced Naval Warfare Gaming System (ENWGS), as the program was going through some major changes and migrating to a new architecture. In 1994 she was recruited as the Modeling and Simulation Engineer for establishing the Initial Operating Capability of the US Atlantic Command (now US Joint Forces Command) Joint Training, Analysis and Simulation Center in Suffolk, Virginia. As the M&S Engineer, she established the modeling and simulation system environment and capability for supporting the Command's Joint training program. Following this assignment, she was selected in 1996 as the System Engineer for the Joint Simulation System (JSIMS) Maritime Program where she was responsible for managing and developing the Navy software component of JSIMS. In January 2000 she was designated as the Senior Civilian Official on the JSIMS program and worked with the new JSIMS Program Manager to rebaseline the program.

Ms. Knight was appointed to the Senior Executive Service in June 2000, reporting to the Chief of Naval Operations, Director of Naval Training and Education. She serves as the JSIMS Alliance Executive, where she is the program and system integrator for JSIMS, directly reporting to the JSIMS Army Program Manager. Her awards include the Navy Meritorious Civilian Service Award, DoN NCCOSC Commander's Teaming Award, DoN Acquisition Reform Executive/ASN RD&A Certificate of Excellence for Support of the Success of Acquisition Reform, SPAWAR Systems Center Exemplary Achievement Award and Publications Award for Technical Literature.

Summer Simulation Multiconference

Tuesday, July 22, 2003, 8:30 am

**Collaborative Virtual Environments: Standards, Applications and Performance****Nicolas D. Georganas, University of Ottawa, Canada****Abstract:**

Collaborative Virtual Environments (CVE) are Virtual Reality simulations running over several computer systems connected via a network and performing some collaborative task. In this talk, several CVE-related issues will be discussed and pertinent middleware standards for CVEs (DIS, SPLINE, HLA,..) will be reviewed. Applications, ranging from defense training simulations to collaborative e-commerce, will be presented. The performance of some applications over the various middleware standards and some prototype systems will finally be discussed.

**Bio:**

Nicolas D. Georganas, FIEEE, FRSC, FCAE, FEIC, OOnt, is Distinguished University Professor and Canada Research Chair in Information Technology at the School of Information Technology and Engineering, University of Ottawa.

He received the Dipl.Ing. degree in Electrical Engineering from the National Technical University of Athens, Greece, in 1966 and the Ph.D. in Electrical Engineering ( Summa cum Laude ) from the University of Ottawa in 1970.

He has published over 300 technical papers and is co-author of the book "Queueing Networks- Exact Computational Algorithms: A Unified Theory by Decomposition and Aggregation," MIT Press, 1989. He has received research grants and contracts totaling more than \$51 million and has supervised more than 175 researchers, including 90 graduate students (25 PhD, 65 MASc) and 19 PostDocs.

In 1990, he was elected Fellow of IEEE. In 1994, he was elected Fellow of the Engineering Institute of Canada. In 1995, he was co-recipient of the IEEE INFOCOM'95 Prize Paper Award. In 1997, he was inducted as Fellow in the Canadian Academy of Engineering and Fellow of the Royal Society of Canada. In 1998, he was selected as the University of Ottawa Researcher of the Year and also received the University 150th Anniversary Medal for Research. In 1999, he was awarded the Thomas W. Eadie Medal of the Royal Society of Canada, funded by Bell Canada, for his contributions to Canadian and International telecommunications. In 2000, he received the A.G.L. McNaughton Gold Medal, the highest distinction of IEEE Canada; the Julian C. Smith Medal of the Engineering Institute of Canada; the OCRI President's for the creation of the National Capital Institute of Telecommunications (NCIT); the Bell Canada Forum Award from the Corporate-Higher Education Forum, the Researcher Achievement Award, from the TeleLearning Network of Centres of Excellence and a Canada Research Chair in Information Technology. In 2001, he was appointed Distinguished University Professor of the University of Ottawa and also received the Order of Ontario, the province's highest and most prestigious honour. In 2002, he received the Killam Prize for Engineering, Canada's most distinguished award for outstanding career achievements, and in 2003 he received the Queen Elisabeth II Golden Jubilee Medal.

Society for Modeling and Simulation International

Wednesday, July 23, 2003, 8:30 am

**Storage Systems and Their Performance Analysis****Alexander Thomasian, New Jersey Institute of Technology, USA****Abstract:**

Dramatic increases in disk storage recording density have resulted in significant improvements in cost per megabyte, but there has been little improvement in disk access time. At the same time "secondary storage" plays a central role, while the CPU computes the path to user-requested data and the network transports it. We therefore consider storage systems from three viewpoints: performance, reliability, and manageability. Performance can be improved via caching and prefetching, disk arm scheduling with single and mirrored disks, priority queueing, e.g., reads versus writes, data placement, and arm placement in anticipation of requests. Redundant arrays of independent disk (RAID) utilize check disks to deal with the data availability issue when disks fail. We will discuss RAID reliability models, numerous configurations, operational modes: (normal, degraded, and rebuild), and analytic and simulation models for performance evaluation. Finally, automating the storage management function is important, as it is much more expensive than storage itself. We review recent developments in this area.

**Bio:**

Alexander Thomasian (IEEE Fellow 2000) received his PhD in Computer Science from UCLA and first joined Case Western Reserve and then Univ. of Southern California. He later spent 14 years at the IBM T. J. Watson Research Center before becoming a Professor at the Computer Science Dept. at NJIT. He has carried out research on the analysis of database concurrency control methods and queueing models of parallel and distributed systems, and he is currently leading NSF-funded research on disk arrays. He has published in over 100 journal and conference publications, has four patents, and has written one book.

### The Game and Simulation Industries: Convergence or Collision

This talk will describe the state of the art in the game industry - the speed with which it is growing and changing, its economic impact, and the challenges it faces. The qualities that characterize games developers, their creative insights and game developed tools and skills have the potential for enhancing the "look and feel," the versimilitude, of simulation while presenting challenges in relational management and team development.



Thomas H. Buscaglia is a principle in the Miami firm of T. H. Buscaglia and Associates, where he practices intellectual property litigation, technology law, and employment litigation. He is one of the main presenters at a National Business Institute continuing legal education seminar for attorneys on Law Firm Marketing with a presentation on "Marketing Technology and Business Development." He is also the author of a series of articles for the Florida Direct Marketing Association newsletter as follows: "Direct Marketing on the Internet" (December 10, 1996); "What's In a Name: Internet Domain Names vs. Trademarks" (February 10, 1997); "Whose Website Is It Anyway? - Content and Copyright" (April 10, 1997); and, "Internet Commerce ... Fact or Fiction?" (September, 1997). He was guest speaker before the Miami - Airport West Chamber of Commerce on the topic "Legal Issues Concerning Marketing Over the Internet." Mr. Buscaglia's passion for interactive computer games is reflected in his role as General Counsel to the Association of Game Developing Artists and he is a legal advisor to the Computer Game Developers Association. Mr. Buscaglia earned his B.A. degree, with departmental honors in philosophy, from the State University of New York at Buffalo. He received a Juris Doctorate in Law, cum laude, from Georgetown University. He is a member of the Dade County Bar and the Federal and American Bar Associations. An experienced trial attorney Mr. Buscaglia is admitted to the Florida Bar, as well as the bars of the United States District Courts for the Southern and Middle Districts of Florida, the Eleventh and Third United States Circuit Courts of Appeal.

## 1. Real-Time Software: Concepts, Scheduling, and Implementation

### Speaker:

Dr. Andrew J. Kornecki, *Embry Riddle Aeronautical University*, USA.andrew.kornecki@erau.edu, <http://faculty.erau.edu/korn>

### Abstract:

In addition to established real-time applications in military, aerospace, aviation, and medical systems - consumer electronics is a growing area using an increasing number of systems with real-time features. For such systems, time criticality and determinism are important, but often safety and reliability are of an equal importance. The software development of such systems requires skills and knowledge often exceeding the standards offered by colleges and universities in many computer science and engineering programs. This three-hour tutorial will address the practical aspects of real-time software development. The presented subjects include: (a) basic real-time terminology and concepts, (b) real-time scheduling, and (c) real-time implementation, including development lifecycle, real-time kernels, and the development process. The tutorial is designed to spark a discussion between control engineers and software engineering practitioners.

The tutorial materials will be available online via Internet and a potential follow-up contact with the instructor is also an available option.

### Tutorial Instructor:

Dr. Andrew J. Kornecki (<http://faculty.erau.edu/korn>) is full professor at the Department of Computing, Embry Riddle Aeronautical University, Daytona Beach, FL. He has over twenty years of research and teaching experience in areas of real time computer systems with emphasis on computer modeling and simulation and ground-based aviation applications.

## 2. Traffic Engineering With MPLS (Multi Protocol Label Switching)

### Speaker: TBA

#### The MPLS Architecture Introduction

- Traffic Engineering
- The Header For IP-v4
- The Basic Operation Of An MPLS Network

#### Traffic Engineering (TE)

#### The Header For IP-v4

#### The Basic Operation Of An MPLS Network

#### The MPLS Label

#### The MPLS Generic Label Format

#### The Label Binding

#### The Label Retention Mode

#### The Label Stack

#### Operations On The Label Stack

#### Label Distribution

#### The Principal Idea Of Label Distribution

#### The Two Philosophies For Label Forwarding

#### Possible Options For LSP Setup

#### The Forwarding Information Base

#### The Label-Switched Path

#### The Penultimate Hop Popping

#### Hop By Hop Routing

#### Piggyback Labels In BGP

#### Explicit Routes CR-LDP

#### LSP Setup Flow

#### RSVP Labels Extension

#### LSP Setup Flow

#### Virtual Private MPLS Networks

#### Common Aspects Between Physical And Virtual Networks

#### Requirements Of A VPN Over IP-Facilities

#### Requirements Of The Tunneling Mechanisms

#### Virtual Leased Lines

#### Virtual Private LAN Segments

#### Virtual Private Routed Networks

#### Virtual Private Dial Networks

#### Label Stacks Across The Backbone

#### VPN Connectivity Using LSP Tunnels

#### Nested LSPs Providing VPN Connectivity

#### QoS Mechanisms And MPLS Separate CoS Mappings Per VPN

#### Customer Survivability In MPLS Networks

#### Components Of An MPLS Network

#### Re-routing Around Link Failure Protection Switching

#### Fast Re-route: Link Protection

#### Fast Re-route: Node Protection



## 3. Multimedia Technologies and Applications in the New Internet World

**Duration:** Full day

**Speaker:**

Nicolas D. Georganas, FRSC, FIEEE, Canada Research Chair in Information Technology Distinguished University Professor Multimedia Communications Research Laboratory (MCRLab) School of Information Technology and Engineering (SITE) University of Ottawa, Canada. He has been leading multimedia application development projects since 1984.  
Georganas@mcrlab.uottawa.ca, <http://www.mcrlab.uottawa.ca/>

**Abstract**

This tutorial is for beginners in multimedia and its objective is to present the state-of-the-art in multimedia enabling technologies and services, with emphasis on the Internet wireline and wireless world. It will also demonstrate new multimedia applications in e-commerce, tele-collaboration, tele-training and tele-medicine using Collaborative Virtual Reality. It will cover the fundamental multimedia topics, enhanced with video clips of international project developments:

- Introduction, Applications
- Networking Technologies (LAN, MAN, WLAN, HAN, WAN, ATM, IP)
- Multimedia to the home (DSL, cable, wireless,...)
- Image, Video and Audio Compression
- Multimedia Synchronization
- Multimedia and the Internet: IP and other protocols, QoS provision, Mobile IP, WAP, applications
- Multimedia conferencing and collaboration tools
- e-commerce and Security issues (Cryptography primer)
- Digital Watermarking for Multimedia
- Virtual Reality and Collaborative Virtual Environments & applications

**DETAILED OUTLINE PART I:**

Introduction  
Recent history of multimedia technologies  
Business and home multimedia applications

Networking Technology for Multimedia  
Local Area Networks (LAN):  
“legacy” LANs (Ethernet, Token Ring)  
FDDI, FDDI-II  
Switched Ethernet  
Isochronous Ethernet (IEEE 802.9)  
Fast Ethernet (100 Mbps)  
100 VG-AnyLAN  
Gigabit Ethernet (IEEE 802.3z)  
Wireless LANs and Wireless Personal Area Networks  
IEEE 802.11  
Bluetooth  
IEEE 802.15  
HomeRF

Wide Area Networking (WAN)  
Key WAN Services for Multimedia  
Bridges and Routers  
X.25 and Frame Relay  
ATM Networking  
Brief review of N-ISDN, B-ISDN, ATM.  
Adaptation layer (AAL) for different ATM classes of service  
ATM comparisons with other technologies  
Multimedia to the Home  
Access Technologies: Telephone, DSL, Cable, Wireless cable  
Fiber-in-the-loop, Fiber-to-the-home, Hybrid Fiber-coax

Digital Image and Video Compression in Multimedia Communications  
Compression needs in Multimedia  
Video services, bandwidth and storage needs  
Image and video coding standards: JPEG, MPEG-1, MPEG-2, MPEG-4, MPEG-7, H.261, H.263  
Software Compression/Decompression

Multimedia Synchronisation  
Basic synchronization concepts and methods  
Synchronization Quality of Service (QoS) Parameters  
Synchronized Multimedia Integration Language (SMIL)

**PART II**

Multimedia and the Internet  
OSI reference model  
Internet Protocols: TCP, UDP, IP, IPv6  
Mobile IP  
Unicast, Broadcast, Multicast  
Protocol requirements for multimedia  
RSVP  
Real Time Transport protocol (RTP, RTCP)  
QoS provisioning over IP networks: IntServ, DiffServ  
Internet telephony, Internet Fax  
WWW, HTML, XML, Java  
Real Time Streaming Protocol (RTSP)  
Government concerns on Web usage

Wireless Internet and Wireless application Protocol (WAP)

Multimedia conferencing and collaboration tools  
Conferencing standards  
Conferencing market evolution  
Conferencing systems  
Tele-collaboration tools

e-Commerce and e-Security  
Cryptography  
Public key Encryption  
Secure Sockets Layer, SHTTP, IPsec, SMIME  
Secure Electronic Transactions (SET)  
Attacks on e-security



Digital Watermarking for Multimedia  
 Classification of watermarks  
 Image, video, audio and text watermarking techniques

Virtual Reality as a new Medium  
 Virtual Reality Modeling Language (VRML)  
 Java3D  
 Distributed Virtual Environments  
 High-Level Architecture (HLA) : A new OMG standard for distributed simulations  
 Applications in industrial training, e-commerce, tele-collaboration

#### BIOGRAPHICAL SKETCH

Nicolas D. Georganas is Canada Research Chair in Information Technology and Distinguished University Professor, Multimedia Communications Research Laboratory (MCRLab), School of Information Technology and Engineering, University of Ottawa, Canada. He has been leading multimedia application development projects since 1984. He was General Chair of the ACM Multimedia 2001 (Ottawa), IEEE Multimedia Systems'97 Conference (ICMCS97) (June 1997, Ottawa) and Technical Program Chair of the IEEE COMSOC MULTIMEDIA'89 (Montebello, Canada) and of the ICCM Multimedia Communications'93 Conference (Banff, Canada). He has served as Guest Editor of the IEEE Journal on Selected Areas in Communications, issues on "Multimedia Communications" (1990) and on "Synchronization Issues in Multimedia Communications" (1996). He is on the editorial boards of the journals Multimedia Tools and Applications, ACM Computing Surveys, Performance Evaluation, Computer Networks, Computer Communications, and was an editor of the IEEE Multimedia Magazine and ACM/Springer Multimedia Systems. He is Fellow of IEEE, Fellow of the Canadian Academy of Engineering, Fellow of the Engineering Institute of Canada and Fellow of the Royal Society of Canada. In 1998, he was honored as the University of Ottawa Researcher of the Year and also received the University 150th Anniversary Gold Medal for Research. In 1999, he received the T.W.Eadie Medal of the Royal Society of Canada, funded by Bell Canada, for contributions to Canadian and International Telecommunications. In 2000, he received the J.C.Smith Medal of the Engineering Institute of Canada, the A.G.L.McNaughton Medal of IEEE Canada, the OCRI Presidents' Award, the Bell-Canada-Forum Award of the Corporate-Higher Education Forum, the TeleLearning Researcher Achievement Award and a Canada Research Chair. In 2001, he received the Order of Ontario and in 2002, the Killam Prize for Engineering, Canada's highest prize.

-ACM Multimedia'96, Boston, [Nov. 1996] [20 persons](excellent

#### 4. The GSM Evolution - Traffic Engineering for Packet Data Services (GSM/GPRS/EDGE)

**Duration:** full-day or half-day (can be adapted)

**Speakers:**

Peter Stuckmann, Christian Hoymann, Tim Irnich Aachen University of Technology, Germany.

**Abstract:**

This tutorial is based on the book written by the Tutorial speakers, *The GSM Evolution* published by John Wiley and Sons, 2002. In this tutorial the principle basics of GPRS and EGPRS comprising the radio interface and the system and protocol architecture will be introduced. Next predicted service platforms and applications like Internet applications, the Wireless Application Protocol (WAP) and real-time applications with their quality of service requirements will be outlined. Suitable traffic models for each application will be introduced. Further QoS management in (E)GPRS with the focus on both the radio and the core network including standard and implementation aspects will be presented. After the introduction of the simulation tool GPRSim that was developed and applied, characteristic performance and system measures given for a best-effort service and for QoS support with service differentiation. Finally the appliance of these comprehensive simulation results for radio network dimensioning presented. Dimensioning examples for a typical introduction and migration scenario given.

**Tutorial Outline:**

- Basics of GPRS
- Wireless Applications and Traffic Models
- QoS Management in GPRS
- Evolution to EDGE
- Traffic Engineering Guidelines for the GSM Evolution

A former version of this tutorial was already held at:

- IEEE 3Gwireless 2001, San Francisco  
<http://delson.org/3gwireless01/tutorial.htm>
- IEEE ICN 2001, Colmar  
<http://iutsun1.colmar.uha.fr/pgmICN01.html>
- IEEE VTC 2002 Fall
- IEEE Globecom 2002

All speakers presented the tutorial at several occasions, including professional industry training courses and the conferences mentioned above. Additionally, all speakers have held various presentations on research from the same area covered by the tutorial.

## 5. Software Reliability and Maintainability

### Speaker:

Prof. (Dr.) Krishan K. Aggarwal, Vice Chancellor Guru Gobind Singh, Indraprastha University, India

### Abstract:

The nature and complexity of software requirements have drastically changed in the last few decades and users all over the world have become much more demanding in terms of cost, schedule, and quality. These three parameters, though all being desirable, have an apparent contradiction at times that can only be resolved by optimum design of software using well established software engineering methodologies.

Given unlimited resources, the majority of software development problems can probably be solved but the challenges confronting the software developers is to produce high quality maintainable software with a finite amount of resources and to a specified schedule. This challenge forces us to adopt software engineering concepts, methodologies, and practices in order to improve the software development process and thereby the product.

What cannot be controlled cannot be measured. This fundamental reality underlines the importance of software metrics, despite the controversy that has surrounded them since Halsead put forth his idea of software science. Every science begins with quantification and so we discuss the use of software metrics in the first part of the tutorial.

The delivery or the release of the software inaugurates the maintenance phase of software. In fact software maintenance is the most expensive and the least predictable stage of software life cycle, representing in some cases more than two-thirds of the total life-cycle cost. Despite the fact that the software maintenance is a very important and challenging task, it is rather poorly managed. A good measure of software maintainability can be devised using parameters such as readability of source code, documentation quality, and understandability of software. Keeping in view the nature of these parameters, a fuzzy approach has been used by us to integrate these three aspects. A new efficient representation of rule bases has been proposed for fuzzy models. This integrated measurement of software maintainability, is the first attempt to quantify integrated maintainability, and is bound to be better than any other single parameter maintainability measurement approach. Thus the output of this model can advise the software project managers in judging the maintenance efficiency. This aspect of Software Maintainability is discussed in the last part of this tutorial.

Prof. K.K. Aggarwal graduated in Electronics and Communication Engineering from Punjab University, Chandigarh, India and obtained a Masters degree in Advanced Electronics from Kurukshetra University, Kurukshetra, India, securing First position in both. Aggarwal has extensively worked in various fields of Electronics and Computer Engineering; the most significant being Quality, Reliability, and Maintainability. Recently, he has been elected President of the Institution of Electronics & Telecommunication Engineers of India.

## 6. Tutorial on Satellite Communications: Issues in Transmission and Access Techniques, Protocol Architecture, and Performance

### Speaker:

Erina Ferro, CNUCE-CNR, Italy  
Franco Davoli, DIST-University of Genoa, Italy

### Abstract:

Satellite transmissions have an important role in telephone communications, television distribution, computer communications, maritime navigation, and military command and control. Moreover, due to their intrinsic nature, in many situations they constitute the only way for communicating. Recent trends in telecommunications indicate that four major growth market/service areas are: messaging and navigation services (wireless and satellite), mobility services (wireless and satellite), video delivery services (cable and satellite), and interactive multimedia services (fibre, satellite, cable). The major drawback in using geostationary satellites is the long delay that can have an important impact in the end-to-end delay user requirements. Moreover, atmospheric conditions may affect the data transmitted in a very heavy way. The tutorial aims at giving the basic elements of telecommunications and networking via geostationary satellites. MEO and LEO constellations are mentioned. Aspects considered will include basic transmission and multiple access techniques, channel modeling and fade countermeasures, IP-based satellite networking, satellite TCP problems and solutions. Performance analysis by theoretical, experimental, and simulation tools will be considered as well.

## 7. NAVI: Learning HLA from an Interactive Exercise

**Sunday 4:00 pm - 6:00 pm**

Speaker: Roberto Revetria, DIP, University of Genoa, Italy  
Abstract:

NAVI is an interactive exercise devoted to train people in development, installation, configuration, and execution of HLA (High Level Architecture) Federations. NAVI provides the opportunity to experiment with the problems and requirements for developing and using HLA simulators. NAVI has been successfully used in the last years for SIREN Program (Simulation Technology Transfer Initiative) transferring HLA know-how to industry, agencies and universities in Europe. The NAVI exercise is based on a naval scenario using Java/C++ Programming Language; the NAVI tutorial is oriented to programmers, developers, simulation experts, HLA project engineers, and researchers. The attendees are expected to have some background in M&S and in fundamentals of computer science.

Roberto Revetria earned his degree in engineering at the University of Genoa and he completed his Ph.D. in Parma on AI and simulation applied to industrial engineering. During his service in the Navy as officer, he was involved in the development of the WSS&S (Weapon System Simulation & Service) Project for developing a web-based simulator. He had experiences in modeling applied to environmental management and production planning in cooperation with major companies (i.e., AMT, Bosch, Marconi). Recently he was active in the development of the WILD (Web Integrated Logistics Designer) initiative, devoted to apply HLA in Industrial Simulation for supply chain management. Email: revetria@itim.unige.it

## 8. VV&T Procedures in Industrial M&S Applications

**Sunday 1:30 pm - 3:30 pm**

Speaker: Chiara Briano, Liophant Simulation Club, Italy  
Abstract:

This tutorial is organized for scientists and technicians interested in VV&T (Verification, Validation and Testing) activity applied to industrial simulation projects. The Tutorial includes lecturing and exercises to be completed in reference to industrial case studies for highlighting critical issues and effective technologies. The tutorial is focusing on methodologies and technologies to be used effectively in industrial projects for measuring simulation confidence and guaranteeing fidelity. The VV&T tutorial is oriented to those responsible for VV&A, subject matter experts, M&S project participants, M&S team members, and researchers. The attendees are expected to have some background in M&S and in computer use.

Chiara Briano obtained the University Short Degree in Logistic and Production Engineering at Genoa University and completed her studies, obtaining the Full Degree in Management Engineering, both summa cum laude. She has been active in computer simulation for many years and she has realized several simulators for industrial

applications (i.e. shipyard construction, target tracking and classification, environmental emergencies management, logistics and industrial management). Currently she is consulting M&S applied to ERP integration, customer satisfaction, company re-organization, and BPR. She is senior partner in two engineering consulting firms. She is a founding member and Director of Liophant Simulation Club. Email: chiara.briano@liophant.org

## 9. Design of Experiments for Simulation Projects

**Sunday Room 2 10:00 am - 12:00 am**

Speakers: Roberto Mosca, DIP, University of Genoa, Italy  
Matteo Brandolini, BRB Studio, Italy

Abstract:

This tutorial is devoted to using DOE (Design of Experiments) in Simulation projects for completing experimental analysis of results. The course includes ANOVA analysis applied to Stochastic Discrete Event Simulation as well as Factorial and Composite Design for Sensitivity Analysis and Meta-modeling. Critical Issues on DOE applied to simulation are highlighted and a detailed overview of techniques and real examples is provided to the attendees. The different approaches provided by the experts of DOE are proposed as well as considerations to be used with industrial simulators (i.e. discrete variables, optimization critical issues and performance limits). The attendees are expected to have some background in statistics.

Roberto Mosca is full professor and Director at the DIP (Department of Industrial Production & Engineering, former Institute of Technology and Mechanical Plants), University of Genoa. He has worked in the simulation sector since 1969 using discrete and stochastic industrial simulators for offline and online applications. His research work focuses on the evaluation of simulation languages and new modeling techniques. His research team is developing new AI applications for industrial plant management. Currently he is directly involved as coordinator in the construction of a new campus in Savona, focused on industrial engineering. Roberto@itim.unige.it

Matteo Brandolini is a senior partner in a consulting company, working from many years in simulation applications; he had experiences applying simulation to industry, process optimization and the military sector. He has used advanced AI (Artificial intelligence Techniques) for Data Fusion and Analysis applied to different sectors. Currently he is active in applying M&S to the retail sector for customer care and logistics optimization. Matteo.brandolini@brbstudio.com

## 10. Overview of Discrete Event Models: Petri Nets, DEVS, G-DEVS etc.

**Sunday 1:30 pm - 3:30 pm**

Speaker: Norbert Giambiasi, LSIS

### Abstract:

This tutorial is devoted to give an overview of characteristics of Discrete-event models and to present different modeling paradigms. The tutorial discusses the possibilities for using these paradigms for modeling and simulation in different sectors of application. The tutorial includes an overview about different techniques and formalism such as Petri Nets, Automata, Event Graphs, DEVS (Discrete-Event Specifications), and Queuing Models. The tutorial provides also fundamentals about new advances and generalizations (i.e., G-DEVS, Generalized DEVS).

Norbert Giambiasi is full professor in Aix-Marseille III University as well as Director of LSIS (Laboratory of Science and Information Systems). He has been active for many years in simulation and currently his research is focusing on researches on DEVS and developments. He is responsible on behalf of France for a Trans Atlantic Master Program in Modeling and Simulation applied to Logistics, sponsored by the European Community and USA. Email: Norbert.giambiasi@lsis.org

## 11. Computer Automated Multi-Paradigm Modelling

**Sunday 4:00 pm - 6:00 pm**

Speaker: Hans Vangeleuwe, Computer Automated Multi-Paradigm Modeling (CAMPaM)

Over the last decades, engineered systems have reached a tremendous level of complexity, involving expertise from many disciplines and entailing a variety of implementation technologies. To address this complexity, CAMPaM integrates three orthogonal directions:

- (i) multi-formalism modeling, concerned with the coupling of and transformation between models described in different formalisms,
- (ii) model abstraction, concerned with the relationship between models at different levels of abstraction, and
- (iii) meta-modeling, concerned with the description (models of models) of classes of models and as such allows formalism specification.

This tutorial will introduce these three aspects of CAMPaM through simple examples.

Firstly, sample simulation formalisms (UML Statecharts, Petri Nets, Hybrid Automata combining Ordinary Differential Equations with Event Scheduling, and DEVS) will be introduced. The relative merits of these will be presented and it will be shown how these formalisms can be easily meta-modelled and how visual modelling environments can be synthesized. Secondly, model transformation will be shown to be at the core of model abstraction, simplification, coupling of models in different formalisms, as well

as of simulator specification. It will be demonstrated how graph rewriting can be used to execute models of transformation.

All demonstrations will use ATOM3, a prototype CAMPaM tool. Links with the OMG's Model Driven Architecture for software design will be made.

This presentation is based on joint work with Pieter Mosterman (The MathWorks) and Juan de Lara (Autonomous University of Madrid).

Hans Vangheluwe is an Assistant Professor in the School of Computer Science at McGill University, Montréal, Canada. He holds degrees in Computer Science, Theoretical Physics and Education from Ghent University in Belgium.

He teaches Modelling and Simulation, as well as Software Design. He also heads the Modelling and Simulation and Design (MSDL) research lab.

He has been the Principal Investigator of a number of research projects focused on the development of a multi-formalism theory for Modelling and Simulation. Some of this work has led to the WEST++ tool, which was commercialized for use in the design and optimization of Waste Water Treatment Plants.

He was the co-founder and coordinator of the European Union's ESPRIT Basic Research Working Group 8467 "Simulation in Europe", and a founding member of the Modelica Design Team. Email: hv@cs.mcgill.ca

## 12. Simulation for Logistics

**Sunday Room 1 10:00 am - 12:00 am**

Speaker: Robert Signorile, Boston College, USA

### Abstract:

This tutorial focuses on providing an overview about benefits provided by Simulation within Logistics. The tutorial provides some fundamentals about these applications in relation to techniques and methodologies to be used. The tutorial includes also a wide set of applications examples in real cases. Critical issues in this application area and directions to modelers are provided, at the same time all the analysis techniques and ROI measures are presented.

Robert Signorile, BC, is professor in Computer Science at Boston College and he has been active for many years in simulation applied to logistics. He is currently USA coordinator of the IEPAL project for an Intensive Educational Program in Advanced Logistics sponsored by FIPSE and involving three major American educational institutions and a large consortium of companies and agencies. Email: Signoril@bc.edu



## 13. Teradata Architecture And Differences: *The New Generation Of Data Warehousing*

### Motivations and Scope of Tutorial:

Find out what makes Teradata's parallel architecture different from other Relational Data Bases. We will explore the architecture and components of Teradata and explain why Teradata provides an Enterprise Data Warehouse (vs. Data Marts). This overview will give you a flavor of the newest tools and utilities available with Teradata 7.0. There will be an opportunity for you to ask questions.

### Tutorial Outline:

- Teradata Warehouse 7.0 Brief Component Overview
- Why a Data Warehouse Database?
- Teradata Components and Architecture
- Virtual processors
- BYNET
- Optimizers
- Parallelism
- File System
- Data Distribution
- Teradata Differentiators
- Teradata Tools and Utilities
- Interactive Questions and Answers

**Intended Audience:** Anyone interested in learning more about data warehouse platforms.

**Prerequisites:** None.

**Tutorial Length:** 2 hours.

**Method of Presentation:** PowerPoint using LCD projector. Tutorial notes will be made available.

**Presenter:** Alison Torres, Director and Teradata Certified Master, Teradata, a Division of NCR

**Email:** Alison.Torres@Teradata-NCR.com

### Presenter's Bio:

Alison Torres is a Director for Teradata's Strategic Warehousing and Technologies Team. She has been working with the Teradata product since 1986 and her Teradata experience includes positions as Senior Systems Engineer, Customer Education Instructor, Technical Team Leader for C&LA, and Senior Data Warehouse Consultant in the areas of data warehousing, performance, physical database design, application and transaction design, and logical data modeling.

Joining Teradata in 1986, Alison's work in the computer industry

has spanned twenty-two years and has been dedicated to the parallel processing relational database environment with an eye towards driving business value from analytical processing. Throughout the years, Alison has been involved in the design, coding, implementation, and documentation of several key business applications. She has also lead teams of cross functional groups to deliver some of the most successful Teradata Enterprise Data Warehouse systems in existence.

Facilitating data warehouse workshops for prospective customers is among Alison's many current responsibilities. These workshops are designed to focus specifically on strategic business opportunities identified by the prospect and to help business users understand how those opportunities can be captured within a data warehouse. The workshops are vendor neutral, addressing only what capabilities a data warehouse should have and how these capabilities relate to solving specific, high value business challenges for the user.

Alison is a Teradata Certified Master, having achieved all six levels of certification. She received a Master of Arts from the Universidad de Salamanca, Spain, holds a Bachelor of Arts from Rutgers College, Rutgers University, and has worked on post-graduate studies at the Rutgers Graduate School of Education.

Alison is the author of "LOOK MA, NO HANDS!", an article available in a recent issue of *Teradata Magazine* that explains how Teradata self-management makes hands-free driving safe for any DBA.

[http://www.teradatamagazine.com/articles/3Q\\_2002/tech2tech/appliedsolutions/default.htm](http://www.teradatamagazine.com/articles/3Q_2002/tech2tech/appliedsolutions/default.htm)

Alison is also past President of the International Board of Directors for Women in NCR, recognized as a thought leader and advocate for women's issues.

## 14. Data Quality from a Business Perspective

### Motivations and Scope of Tutorial:

Data quality is defined as the measure of the suitability of data for its intended purpose. It is important to understand that Data quality is a business problem, not an IT problem. A process must be put in place to identify and correct the root causes of specific data quality issues that are negatively impacting operational and analytical processes that are germane to achieving stated business goals and objectives.

The Data Warehouse is a great place to manage business decisions and building it right, from the start, is a big help to enable that management. This session will cover data quality issues that impact data warehouse performance. The session is suitable for both IT and Business users, and includes actual customer experiences.

### Tutorial Outline:

- Key Business Objectives
- Business Rules
- Data Quality Defined
- Data Quality Misconceptions
- Dimensions of Data Quality
- Business Impact of Data Quality Issues
- Root Causes of Data Quality Problems
- Data Quality Improvement Process Flow
- Solutions for Data Quality Problems
- Building a Quality Oriented Data Warehouse
- Customer Success Stories

**Intended Audience:** Anyone interested in learning the criteria for implementing successful data warehouses; IT Professionals.

**Prerequisites:** None.

**Tutorial Length:** 1 hour.

**Method of Presentation:** PowerPoint using LCD projector. Tutorial notes will be made available.

**Presenter:** Alison Torres  
Director and Teradata Certified Master  
Teradata, a Division of NCR  
718 Union Avenue, Suite 204  
Middlesex, New Jersey 08846  
Voice: 732-271-7712  
Email: Alison.Torres@Teradata-NCR.com

### Presenter's Bio:

Alison Torres is a Director for Teradata's Strategic Warehousing and Technologies Team. She has been working with the Teradata product since 1986 and her Teradata experience includes positions as Senior Systems Engineer, Customer Education Instructor, Technical Team Leader for C&LA, and Senior Data Warehouse Consultant in the areas of data warehousing, performance, physical database design, application and transaction design, and logical data modeling.

## 15. The Promise of Data Warehousing: Remember Your Map! (Formulating Business Rules)

### Motivations and Scope of Tutorial:

Business rules are of utmost importance when tackling large data warehouse projects and often, those rules have not been adequately addressed in either the analysis or design phases of system development. Typically, business rules have been buried in program code or in database structures. It turns out, however, that the identification of business rules is important in its own right. Moreover, it is different from the definition of data structure in a data model and from the definition of processes.

Getting to the heart of business requirements involves an understanding of the enterprise at a deep level, without regard for the technology or even the procedural details, it is important to have a conceptual layout or map of the enterprise and its function and structure. Only then should one proceed forward to determine how technology might help enforce the rules more efficiently, and how to structure such technology so that it is compatible with the enterprise.

This tutorial will provide training on the analysis of business rules to be undertaken before embarking on data warehousing projects.

### Tutorial Outline:

- The Obstacles
- The Promise: Data Warehousing
- What Exactly is Data Warehousing?
- A Place
- A Process
- A Methodology
- How Data Warehousing overcomes those obstacles
- The Map: Business Rules
- Planning
- Design & Implementation
- Usage, Support, and Enhancements
- The Future
- Active Data Warehousing
- CRM
- The Conclusion
- Delivering on the Promise
- Customer Success Stories

**Intended Audience:** Anyone interested in learning the criteria for implementing successful data warehouses; IT Professionals.

**Prerequisites:** None.

**Tutorial Length:** 2 hours.

**Method of Presentation:** PowerPoint using LCD projector. Tutorial notes will be made available.

**Presenter:** Alison Torres

## 16. Process model: Distance Education Course – From Planning to Evaluating e-Learning Courses

### Motivations and Scope of Tutorial:

Sometimes (as a lecturer) when we think of e-learning courses, we focus on giving the course (offering the possibility to learn online, providing electronic learning material, interact with the participants, etc). But providing an e-learning course is more than that. It is a process that starts from planning, includes deploying and delivering, and ends with evaluating and improving. All these steps have to be considered when you want to have success on the growing market of e-Learning.

Providing an e-Learning or distance education course is a process that starts with the planning (addressing the requirements and preferences of the lecturer and the target group, didactical settings, learning material, electronic support, etc.) and deployment (fixing the time-schedule, arranging an e-Learning platform (setting user accounts, installing forums, chat, ...) of the course.

The next step in the process is the delivery of the online course. Questions relevant to this step, include: which didactical setting for which target group, how to compensate missing face-to face contacts, how to arrange and work with virtual groups, etc. that will be discussed in this tutorial.

The final step in the process includes evaluation, improvement of the didactical setting, the course material, etc. This often neglected and omitted step is essential in improving the quality and the acceptance of distance education courses.

The instructor will discuss best practices (case studies) and lessons learned based on her experiences in the areas of universities, schools and adult continuing education. The aim of this tutorial is to present a holistic view on e-Learning courses enriched with personal experiences and practical knowledge.

**Tutorial Outline:**  
Forthcoming.

**Intended Audience:** Participants interested in creating and delivering online education. Technical and non-technical participants are welcome.

**Prerequisites:** None.

**Tutorial Length:** 2 hours.

**Method of Presentation:** PowerPoint using LCD projector. Tutorial notes will be made available.

Presenter: Dipl. Ing. Dr. Susanne Reisinger  
Institute for Information Processing and Microprocessor  
Technology (FIM)  
Johannes Kepler University  
Linz, Austria  
EMAIL: [sreisinger@fim.uni-linz.ac.at](mailto:sreisinger@fim.uni-linz.ac.at)  
WWW : <http://www.fim.uni-linz.ac.at>

### Presenter's Bio:

Dipl. Ing. Dr. Susanne Reisinger studied computer science at the Johannes Kepler University (Austria). At present she works as university assistant at the Institute for Information Processing and Microprocessor Technology (FIM). As university assistant she provides lectures in the area of distance education, personal digital assistants (PDA's, Palm and PocketPC), software engineering, IT Security, programming (C++) and operating systems. Within her dissertation she focused on Distance Education (Distance Teaching/ Coaching/Learning), intelligent mobile agents and the combination of these two topics. Furthermore, in the area of Distance Education, she is a team member of the project "WeLearn - Web Environment for Learning" and participates in different e-Learning lectures and case studies (with varying didactical settings, target groups, requirements, etc.), where WeLearn is used to support and enable e-learning.

## Summer Computer Simulation Conference 2003

### General Chair

Agostino G. Bruzzone, MISS, DIP, University of Genoa, Italy

### Program Chairs

Mhamed Itmi, PSI-MISS, INSA, Rouen, France

### Steering Committee Chair

Mohammad S. Obaidat, Monmouth University, USA

## AGENT- DIRECTED SIMULATION

**Chair: Tuncer Ören, MISS, Canada**

### Session 1: Agent Direct Simulation

Monday Room 4 3:30 pm - 5:00 pm

**Chair: Tuncer Ören, MISS - Ottawa Center, ON Canada**

#### Fuzzy Agents With Dynamic Personality for the Simulation of Human Behavior

Nasser Ghasem-Aghaee, *University of Ottawa, Canada*

Tuncer I. Oren, *University of Isfahan, Iran*

#### Personality Representation Processable in Fuzzy Logic for Simulation of Human Behavior

Tuncer Ören, Nasser Ghasem-Aghaee

*University of Ottawa, Canada*

#### Simulation Using Intelligent Mobile Agents

András Jávör, Gergely Mészáros-Komáromy

*Budapest University of Technology and Economics, Hungary*

### Session 2: Agent Direct Simulation

Tuesday Room 4 3:30 pm - 5:00 pm

**Chair: Tuncer Ören, MISS - Ottawa Center, ON Canada**

#### A Simulation-based Approach to Developing Real-time Distributed Control Systems

Robert W. Brennan, James Wang

*University of Calgary, Canada*

#### Agent-Based Modeling with Game Theory Constructs

Raymond R Hill, Wright State University, USA

Joseph C Price, Air Force Institute of Technology, USA

Lance E Champagne, Air Force Institute of Technology, USA

## BUSINESS & INDUSTRY

**Chair: Priscilla Elfrey, NASA & NCS, FL USA**

### Session 1: Business & Industry

Monday Room 5 10:30 am - 12:00 pm

**Chair: Roberto Revetria, ITIM, Italy**

#### Predicting the Impact on Throughput of a New Information System

George Tompkins, Robert Burnside, Johnell Gonzales-Lujan

*Los Alamos National Laboratory, USA*

#### Engine Flow Fence Actuator Sensitivity Analysis Using Mathematical Modeling & Computer Simulation

Oswald Harris, *Honeywell Engines, USA*

#### Higher-Performance Arbitration Circuit for Inter-processor Communication

Jih-Fu Tu, *St. John's & St. Mary's Institute of Technology, Taiwan*

### Session 2: Business & Industry

Tuesday Room 5 10:30 am - 12:00 pm

**Chair: Priscilla Elfrey, NASA & NCS, FL USA**

#### Simulation for the Reverse Management of Business Processes Alessandra Orsoni, Agostino Bruzzone

*University of Genoa, Italy*

#### Simulation-Based Assessment of Dense Gas Release Hazard in Industrial Facilities

Alessandra Orsoni, Giribone Pietro

*University of Genoa, Italy*

#### Identification and modelling of some of the effective factors in the Bushehr NPP control room operator's decision making process

Kamran Sepanloo, Reza Jafarian

*Atomic Energy Organisation of Iran, Iran*

### Session 3: Business & Industry

Tuesday Room 5 1:30 pm - 3:00 pm

**Chair: Priscilla Elfrey, NASA & NCS, FL USA**

#### The Simulation Industry in Search of Recognition, The Next Step

Lorraine Grace, *UCF, USA*

#### Computer Aided Multi-Paradigm Modelling of Hybrid Systems with AToM3

Juan de Lara, Manuel Alfonso

*Universidad Autonoma Madrid, Spain*

Hans Vangheluwe, *McGill University Canada*



**SIMS: A Modeling and Simulation Platform for Intrusion Monitoring/Detection Systems**

Ashish Garg, Shambhu Upadhyaya, Ramkumar Chinchani  
*University at Buffalo, State University of New York, USA*

**Session 4: Business & Industry**

Wednesday Room 5 10:30 am - 12:00 pm

**Chair: Priscilla Elfrey, NASA & NCS, FL USA**

**A Random Walk Toward Building an Agenda for the Future of Simulation**

Priscilla Elfrey, NASA KSC, USA

**An Efficient Sampling Technique for Stochastic Supply Chain Simulations**

Wing Yan Hung, Sergei Kucherenko, Nouri Samsatli, Nilay Shah  
*Imperial College London, United Kingdom*

**A Robust Design of a Static VAR Compensator Controller for Power System Stability Improvement**

Abu Rahim, Samir Al-Baiyat  
*K.F. University of Petroleum and Minerals, Saudi Arabia*

**LIFE SCIENCE SIMULATION**

**Chair: David R.C. Hill, ISIMA, France**

**Session 1: Life Science Simulation**

Wednesday Room 5 1:30 pm - 3:00 pm

**Chair: David R.C. Hill, ISIMA, France**

**Simulation of microarray experiments**

Vincent Barra, Christophe Gouinaud  
*LIMOS, AUBIERE, France*

**FOREST: A System for Developing and Evaluating Ecosystem Simulation Models**

Heather May, John Conery  
*University of Oregon, USA*

**On the modeling and visualization of heart valve closure mechanisms**

Sriprakash Sarathy, Niranjana Talukder, Jarrell Reed  
*Clark Atlanta University, USA*

**Forming of Controlled Living Microenvironments**

Alexander Amelkin, Moscow State University of Food Production,  
*Russian Federation*

**Session 2: Energy & Minerals Production Systems****Simulation and Risks Engineering**

Wednesday Room 5 1:30 pm - 3:00 pm  
**Chair: Samuel Frimpong, CAMDeR University of Alberta, Canada**

**Performance Simulation of Shovel Excavators for Earthmoving Operations**

Samuel Frimpong, Yafei Hu, Zongyu Chang  
*University of Alberta, Canada*

**Surface Mining Excavation Monitoring Using Spot Satellite Imaging**

Nuray Erdogan, Abdurrahim Ozgenoglu,  
Zuhal Akyurek, Samuel Frimpong  
*University of Alberta, Canada*

**NUMSOSS: Numerical Simulation Software for Oil Sand Slurry Flow in Flexible Pipelines**

Samuel Frimpong, Rufus Ayodele, Jozef Szymanski  
*University of Alberta, Canada*

**Simulation Tools for Industrial Noise Level Estimation: The Real Case of a Power Station**

Domenico Falcone, Vincenzo Duraccio, Angelo Pette  
*University of Cassino, Italy*

**MARITIME SIMULATION**

**Chairs: Pertti Broas, VTT, Finland  
Aldo Zini, Cetena/Fincantieri, Italy**

**Session 1: Maritime Simulation**

Monday Room 2 3:30 pm - 5:00 pm

**Chair: Pertti Broas, VTT, Finland**

**VISION Virtual Ship Simulation**

Francesco F.P. Perra, Aldo Guagnano,  
Orizzonte Sistemi Navali S.P.A, Italy.  
Riccardo Necrisi, Necrisi Tozzi  
*CETENA, Italy*

**Development, Validation, and Application of the Dynaface Helicopter / Ship Dynamic Interface Simulation Software Package**

Robert G. Langlois, Carleton University, Canada  
Michael LaRosa, Atef R. Tadros  
Indal Technologies Inc., Canada

**Simulating the Effects of Ship Motion on Postural Stability Using Articulated Dynamic Models**

Robert G. Langlois, Joyce Wedge  
*Carleton University, Canada*

# Summer Computer Simulation Conference 2003

## Simulation of Klaipeda Oil Terminal

Henrikas Pranevicius, Kaunas University of Technology, Lithuania

## Session 2: Maritime Simulation

Tuesday Room 2 3:30 pm - 5:00 pm

Chair: Aldo Zini, Cetena/Fincantieri, Italy

## On-Board Training System with improved damage control model

Luigi Vindigni, Yves Cote, Tony El-Chakieh  
CAE Inc., Canada

## Computing Simulation Model of Shipbuilding Organization Process

Ante Munitic, Slavko Simundic, Josko Dvornik  
Maritime Faculty of Split, Croatia

## Virtual Simulation of Open Sea and Harbour Manoeuvring of Cruise Vessels

Giovanni Cazzani, Roberta Depascale,  
Luca Sebastiani, Andrea Lommi  
Cetena S.p.A., Italy  
Alessia Coan, Fincantieri S.p.A., Italy

## MILITARY APPLICATIONS AND SIMULATION

Chairs: Robert Lutz, John Hopkins University APL, USA  
Joe Uzdziński, Lockheed Martin, USA

## Session 1: Simulation Methodologies for Military Network Applications

Monday Room 1 10:30 am - 12:00 pm

Chair: Kevin A. Kwiat, Air Force Research Lab, Information Directorate, USA

## Integrating Distributed Wireless Simulation Into Genesis Framework

Boleslaw Szymanski, Kiran Madnani  
Rensselaer Polytechnic Institute, USA

## Fluid models of wireless networks

R Srikant, Atilla Eryilmaz  
University of Illinois, USA

## Simulation-based Tools for Validation of Distributed Network Protocols

Kaliappa Ravindran, City University of New York, USA  
Kevin Kwiat, Air Force Research Lab, USA

## A Conceptual Model of the Capability to Deliver Military Capability-based Planning

Chris Pogue\*, A Vallerand  
Dept of National Defence, Canada

## Session 2: Air and Missile Defense Analysis

Monday Room 1 1:30 pm - 3:00 pm

Chair: Joe Uzdziński, Lockheed Martin, USA

## Using the High-Level Architecture to Evaluate C4ISR System Design in a Battlefield Centext

C. Matthew Palmer, Lockheed Martin, USA

## Sea-Based Missile Defense System Effectiveness Analysis

Joseph E. Uzdziński, Timothy J. Sullivan, Robert R. Koury  
Lockheed Martin, USA

## Missile Defense as a Capacity Planning Problem

Jerry Couretas, Lockheed Martin, USA

## Session 3: Defense Systems Performance Evaluation

Monday Room 1 3:30 pm - 5:00 pm

Chair: Robert Lutz, John Hopkins University APL, USA

## Use of a Hardware-in-the-Loop Simulation to Determine System Performance as Part of a Shelf Life Extension Study for an Air Defense Missile System

David Curry, Craig Combs, Susan Christiansen, Marcia Holmes  
US Army Aviation and Missile Command, USA

## Search Algorithm for Nonlinear Stochastic System – Bay of Biscay Scenario

Subhashini Ganapathy, Sundaram Narayanan, Raymond Hill  
Wright State University, USA

## On the Use of Virtual Prototyping in Ship Design

Andrea I. Lommi, Aldo Zini, Davide Tozzi, Riccardo Necrisi  
CETENA S.p.A., Italy.  
Alessio Carta, Marco Parapetto  
Italian Navy, Italy

## The Research of Simulation Grid Oriented Performance Evaluation of C3I

Ling Yun-xiang, Qiu Di-shan, Gao Ming  
NUDT, China

## Session 4: Military Simulation

Tuesday Room 1 10:30 am - 12:00 pm

Chair: Joe Uzdziński, Lockheed Martin, USA

## A Simulation/Prototype Co-Design Approach for Assuring the Effectiveness of Securing a Distributed System

Kevin A. Kwiat, Air Force Research Laboratory, AFRL/IFGA, USA  
Joseph V. Beasock, PAR, USA

### Suggesting a Common Framework for the Classification of Military Training and Computer Game Simulators

Torben Svane, Lars Karlsson  
*Halmstad University, Sweden*

### Converging Voice Over Internet Protocol (VoIP) with Distributed M&S

Scott Holben, Robert Johnson  
Lockheed Martin, USA

### “Tamiza” - The Simulation Based Training System Embedded In Real Military Equipment

Piotr Michalowski, Marek Iwaniuk  
*Air Force Institute of Technology, Poland*

## M&S METHODOLOGY, TOOLS AND APPLICATIONS

**Chairs: Fernando Barros, University of Coimbra, Portugal**  
**Ralph Huntsinger, MISS - CSUCHico, CA USA**

### Session 1: M&S Methodology, Tools and Applications

Monday Room 3 10:30 am - 12:00 pm  
**Chair: Fernando Barros, University of Coimbra, Portugal**

### MDA Compliant Design of SimExplorer A Software Tool to Handle Simulation Experimental Frameworks

Frederic Amblard, Stéphan Bernard, Jérôme Truffot, Guillaume Deffuant, *Cemagref, LISC, France*  
David R.C. Hill, *CNRS, LIMOS, France*

### Knowledge-based Computational Model Assembling

Martin van Hees, Knowledge Based Solutions, The Netherlands

### From Class Diagrams to Zope Products with meta-modelling tool AToM3

Andriy Levytskyy, Eugene Kerckhoffs  
*TU Delft, ITS\Mediamatica, The Netherlands*

### Beyond limits in Kohonen's self-organized clustering

Miroslav Snorek, Czech Technical University, Czech Republic

### Session 2: M&S Methodology, Tools and Applications

Monday Room 3 1:30 pm - 3:00 pm  
**Chair: Bernard Zeigler, University of Arizona, USA**

### A New Framework for the Analysis of Simultaneous Events

Christoph Barz, Rolf Göppfarth, Peter Martini, Andre Wenzel  
*University of Bonn, Germany*

### A New Approach for the Parallel Solution of ODE's Expressed in Symmetric Form

Osman Abou-Rabia, *Laurentian University, Canada*

### Identifying Equivalence of DEVs: A Language Approach

Moon Hwang, *Cubictek, Co., Ltd., USA*

### Periodic Time Series Evaluation & Model Construction

Jerry Couretas, *LM, USA*

### Session 3: M&S Methodology, Tools and Applications

Monday Room 3 3:30 pm - 5:00 pm  
**Chair: Fernando Barros, University of Coimbra, Portugal**

### Using Simulations as a Persuasive Technology in Secondary School Technical Curriculum

Thomas Mastaglio, *MYMIC LLC, USA*  
George Harrison, Narquita Snowden  
*Norfolk State University, USA*

### Remote execution and 3D visualization of Cell-DEVs model

Gabriel Wainer, Wenhong Chen  
*Carleton University, Canada*

### On a Difference Equations Model for HIV/AIDS Development

Bhagwan Aggarwala  
*University of Calgary, Canada*

### Improving Finite Elements Method models using Cell-DEVs

Gabriel Wainer, Hesham Saadawi  
*Carleton University, Canada*

### Session 4: M&S Methodology, Tools and Applications

Tuesday Room 3 10:30 am - 12:00 pm  
**Chair: Ralph Huntsinger, MISS - CSUCHico, CA USA**

### A Model for Software Error Estimation

Darush Davani, Goran Trajkovski  
*Towson University, USA*

## A Faster Implementation of Devs in the Joint MEASURE Simulation Environment

Steven Hall, Shankar Venkatesan, Donald Wood  
*Lockheed Martin, USA*

## Automated Symbolic Generation of Vector Graph Theoretic Object Based Non-Linear Dynamic Simulation Models

Sriprakash Sarathy, Khalil Shujaee, *Clark Atlanta University, USA*  
Kayin Canon, *Georgia Institute of Technology, USA*

## Technique for Identifying An Observable Process With One of Several Simulation Models

Nicholas Nechval, Konstantin Nechval,  
Vladimir Strelchonok, Edgars Vasermanis  
*Institute of Transport and Telecommunication, Latvia*

## Session 5: M&S Methodology, Tools and Applications

Tuesday Room 3 1:30 pm - 3:00 pm  
Chair: Gabriel Wainer, Carleton University, Canada

## Efficient Simulation of Large Dynamic Structure Cell Spaces

Alexandre Muzy, Eric Innocenti,  
Antoine Aiello, Jean-Francois Santucci,  
*University of Corsica, France*  
Fernando Barros, *Universidade de Coimbra, Portugal*

## Explanatory reasoning: from knowledge based systems to simulation systems

Elamri Fouad, Pécuchet Jean-Pierre, *Insa, France*  
Itmi Mhamed, *College of Engineering, USA*

## Simulation The Inter-Component Interactions in Software Systems

Boris Shishkov, Jan Dietz, Delft University of Technology, The Netherlands  
Joseph Barjis, Thames Valley University, United Kingdom

## Simulation Speedup for DEVS Models by Composition-Based Compilation

Wan Bok Lee, Tag Gon Kim  
*KAIST, Korea*

## Session 6: M&S Methodology, Tools and Applications

Tuesday Room 3 3:30 pm - 5:00 pm  
Chair: J.M. Couretas, Lockheed Martin, USA

## Mapping ODEs to DEVS: Adaptive Quantization

Jean-Sebastien Bolduc, Hans L Vangheluwe, McGill University, Canada

## The Antic 2 Training Multi Agent Simulation System

Samuel Morisset, Jean-Pierre Pecuchet, Marc Savall  
Insa of Rouen, PSI, France

## A Simulation Based DSS For Modeling Passenger Arrivals and Departures in an Immigration System of a Major International Airport

Masood Badri, *United Arab Emirates University, United Arab Emirates*

## Session 7: M&S Methodology, Tools and Applications

Wednesday Room 3 10:30 am - 12:00 pm  
Chair: Hans Vangeleuwe, McGills University, Canada

## A Unified View of Time and Causality and its Application to Distributed Systems

Hessam S. Sarjoughian, Arizona State University, USA  
James Nutaro, University of Arizona, USA

## Modeling and Simulation OF Switched Systems: A Dynamic Structure Approach

Fernando J Barros, University of Coimbra, Portugal

## Empirical Analysis of Legacy Heuristics using Simulation-Based Methods

Raymond R Hill, Wright State University, USA.  
Yong Kun Cho, James T Moore, Air Force Institute of Technology, USA

## An Application of Lean Concepts and Simulation for Drainage Systems Maintenance Operations

Albert Agbulos, Mohamed Al-Hussein, Simaan Abou Rizk  
University of Alberta, Canada.  
John Roesch, City of Edmonton, Canada

## ON-LINE SIMULATION

Chair: Helena Szczerbicka, University of Hannover, Germany

## Session 1: On-Line Simulation

Wednesday Room 4 1:30 pm - 3:00 pm  
Chair: Helena Szczerbicka, University of Hannover, Germany

## Computer-Based Aiding to Reduce Human Error in Real-Time Complex Decision Making



Damodar Bhandarkar, *Pennsylvania State University, USA*

**On-Line Simulation: Towards New Statistical Approaches**  
Thomas Bessey, *University of Hannover, Germany*

**Needs and Proposals for Theoretical Research on On-Line Simulation**  
Thomas Bessey, *University of Hannover, Germany*

**Intelligent Design and Real-time Simulation on Control Systems**  
Honghui Zhu, *Wuhan University of Technology, China*

## OPTIMIZATION OF LOGISTIC SYSTEMS THROUGH SIMULATION

**Chairs: Miquel Angel Piera, UA Barcelona, Spain  
Antoni Guasch, UPC, Spain**

**Session 1: Optimization of Logistic Systems Through Simulation**  
Tuesday Room 4 10:30 am - 12:00 pm  
Chair: Miquel Angel Piera, UA Barcelona, Spain

**Simulation of a Crossdocking Operation in a Just-in-Time Environment**  
Karina Hauser, *Utah State University, USA*  
Chen Chung, *University of Kentucky, USA*

**Net-Simulation: combining optimisation and Simulation in the textile Industry**  
Alberto Sanfeliu, Vicenç Puig, Antoni Guasch  
*Universitat Politècnica de Catalunya, Spain*

**Optimization of a Large Steelmaking Workshop Through Integration of Computer Simulation and Design of Experiment**  
Ali Azadeh, Pantea Hazegazam, Kaveh Asghari Rod  
*University of Tebran, Iran*

**Session 2: Optimization of Logistic Systems Through Simulation**  
Tuesday 22 Room 4 1:30 pm - 3:00 pm  
Chair: Toni Guasch, UPC Barcelona, Spain

**Professional Support for Cooperative Simulation Projects - A Challenge for the Simulation of Logistics and Production Networks**  
Carlos Jahn, *Fraunhofer IFF, Germany*

**Uncertainty in Modelling and Its Impact on Optimisation Domain; Network Services Pricing**  
Mariusz Kamola, Piotr Arabas, Krzysztof Malinowski  
*Warsaw University of Technology, Poland*

**Web Integrated Logistics Design: an HLA Framework for Supplying Negotiation**  
Agostino Bruzzone, Roberto Revetria  
*University of Genoa, Italy*

**Session 3: Optimization of Logistic Systems Through Simulation**  
Wednesday Room 4 10:30 am - 12:00 pm  
Chair: Miquel Angel Piera, UA Barcelona, Spain

**Simulation and Optimization of Logistic and Production Systems Using Discrete and Continuous PN**  
Emilio Jiménez, Mercedes Pérez  
*University of La Rioja, Spain*

**Optimization of Logistic Systems Through Simulation: Simulation based Value-added-services - Analysis and Evaluation of Predictive Alteration Planning**  
Andreas Hellmann, Ulrich Jessen  
*Fraunhofer Institute for Material Flow and Logistics, Germany*

**A Methodology to Improve Simulation Optimization Approach for Process Scheduling Through Petri Net Formalism**  
Miquel Angel Piera, Toni Guasch, Mercedes Elisabet Narciso  
*Universitat Autònoma de Barcelona, Spain*

## PRODUCTION & MANUFACTURING

**Chairs:**  
**Edward Williams, PMCorp, USA**

**Session 1: Production & Manufacturing**  
Monday Room 4 10:30 am - 12:00 pm  
Chair: Edward Williams, PMCorp, USA

**Exploring Alternatives in an Automotive Industry Job Shop Using Simulation**  
Edward Williams, Ryan VanBelle  
*University of Michigan, USA*

**Simulation-based Order Acceptance in Make-to-order Manufacturing Systems**  
Amitava Nandi, *Nortel Networks, Canada*

# Summer Computer Simulation Conference 2003

Paul Rogers, *The University of Calgary, Canada*

## The Use of Data Development Analysis and Simulation in Process Engineering

Andrew Greasley, *Aston University, United Kingdom*

## A new dispatching rule for stochastic and dynamic job scheduling

Umar M. Al-Turki, Abdulbasit A. Andijani, Shaikh Arifulsalam  
*KFUPM, Systems Engineering, Dhahran, Saudi Arabia*

## Session 2: Production & Manufacturing

Monday Room 4 1:30 pm - 3:00 pm

Chair: Edward Williams, PMCorp, USA

## Design and Validation of an IFDI System by the Employment of Artificial Neural Networks

Domenico Falcone, Fabio De Felice, Alessandro Silvestri, Vincenzo Duraccio, GianPaolo Di Bona  
*University of Cassino, Italy*

## Simulation as a Tool in Understanding the Concepts of Lean Manufacturing

Bernard J Schroer, *University of Alabama Huntsville, USA*

## A Simulation Study on Color Rescheduling Storage in an Automotive Factory

Dug Hee Moon, *Changwon National University, Korea*  
Ha Seok Kim, *GM Daewoo Auto and Technology Co, Korea*

## SIMULATION IN TRANSPORTATIONS

Chairs: Fred Wieland, MITRE, USA

Essam Radwan, UCF, FL USA

### Session 1: Aviation Applications

Monday Room 2 10:30 am - 12:00 pm

Chair: Fred Wieland, MITRE, USA

## An Organizational Approach to Assessing the Need for a Distributed Simulation

Patricia Liguori, *The MITRE Corporation, USA*

## Building the Timetable from Bottom-Up Demand A Micro-Econometric Approach

Jennifer Gentry, Dipasis Bhadra, Wells Michael  
Brendan Hogan, Moreno-Hines Felipe  
*MITRE/CAASD, USA*

## A Simulation Study of the Passenger Check-in System at the Ottawa International Airport

Aaron Nsakanda, Yuheng Cao, Irwin Pressman  
*Carleton University, Canada*

### Session 2: Ground Transportation

Monday Room 2 1:30 pm - 3:00 pm

Chair: Essam Radwan, UCF, FL USA

## Overview of Driving Simulator Research Capabilities at The University of Central Florida

Harold Klee, *University of Central Florida, USA*

## Driving Simulators Application to Left Turn Gap Acceptance

Essam Radwan, *UCF, CATSS, USA*

## Investigating Compressibility of Large-Scale Microscopic Transportation Systems Simulation

Sherif Ishak, Ciprian Alecsandru  
*Louisiana State University, USA*

## Simulation of the Shuttle-Bus Pilgrim Transportation System Between the Holy Shrines of Hajj

Hussam Soliman, *King Saud University, Saudi Arabia*  
Sahl Al-Sabban, *Ministry of Hajj, Saudi Arabia*  
Osama Abduh, *Ministry of Communication, Saudi Arabia*

### Session 3: Invited Talk of Simulation in Transportations

Tuesday Room 2 10:30 am - 12:00 pm

Chair: Fred Wieland, MITRE, USA

Speaker: Dr. Amy Pritchett

### Session 4: Ground Transportation

Tuesday Room 2 1:30 pm - 3:00 pm

Chair: Essam Radwan, UCF, FL USA

## SHAKER: A Maximum Throughput Model for Toll Collection Facilities

Marguerite Zarrillo, A. Essam Radwan, Daniel Schmitt  
*University of Massachusetts Dartmouth, USA*

## A brake disc's temperature estimation module

Said Hayati, *Institut National de Recherche sur les Transports et leur Sécurité, France*  
Samuel Artus, *IPSIS, France*  
Marcel Staroswiecki, Vincent Cocquempot  
*Université des Sciences et Technologies de Lille, France*

## Modeling Driver Behavior: A Combined Equation-Based and Fuzzy-Based Approach

Anis Ben Amor, Shigeyoshi Watanabe  
*The University of ElectroCommunications, Japan*

### Session 5: Ground Transportation

Summer Simulation Multiconference

Wednesday Room 2 1:30 pm - 3:00 pm  
**Chair: Fred Wieland, MITRE, USA**

**TNCC and the No-Queue-Maximum-Throughput Indicator at Toll Facilities**

Marguerite Zarrillo, A. Essam Radwan  
*University of Massachusetts Dartmouth, USA*

**Traffic Accident Simulation and Animation**

Mohamed Abdel-Aty, *University of Central Florida, USA*  
 Hala ElAarag, *Stetson University, USA*

**A Simulation Study for Automated Path Planning in Transportation Systems**

Dr. Balqies Sadoun, *Al-Balqa' Applied University, Jordan*

**Session 6: Ground Transportation**

Wednesday Room 2 3:30 pm - 5:00 pm  
**Chair: Abdellah El Moudni, UTBM, France**

**A Game-Based, Multi-Agent Coordination Mechanism - Application to Road Traffic and Driving Simulations**

Alexis Champion, *INRETS, MSIS, France*  
 Stéphane Espié, Jean-Michel Auberlet  
*CS-Srilog, France*  
 René Mandiau, Christophe Kolski  
*LAMIH, RAIHM, France*

**Predictive Quantization-based Filtering in Distributed Traffic Simulation**

JongKeun Lee, *Intelligent Research lab, Korea*  
 SungDo Chi, Bernard P. Zeigler, *ACIMS, USA*

**Vehicle Origin-Destination Petri Net: Analysis Techniques**

Abdellah El Moudni, A Abbas-Turki, O. Grunder  
*Université de Technologie de Belfort, France*

**TRACK: SCIENCE & TECHNOLOGY**

**Chair: Robert McGraw, RAM, CA USA**

**Session 1: Science & Technology**

Wednesday Room 3 1:30 pm - 3:00 pm  
**Chair: Abdelkhalak El Hami, INSA Rouen, France**

**JavaHASE: A Web-based Simulation Environment**

Frederic G Mallet, Roland N Ibbett  
 School of Informatics, ICSA, United Kingdom.  
*Institute for System Level Integration, United Kingdom*

**Simulating General Relativity**

Stan Raczynski  
*Universidad Panamericana, Mexico*

**Numerical Simulation of a Piezoelectric Engine with Progressive Wave via a Reliability Technique.**

Abdelkhalak El Hami, *INSA Rouen, France*  
 Bouchaib Radi, *ENSAM-Meknès, Morocco*

**Session 1: Science & Technology**

Wednesday Room 3 3:30 pm - 5:00 pm  
**Chair: Robert McGraw, RAM, CA USA**

**Simulation in the Mobile Telephony market: Price Discrimination Strategy Under Asymmetrical Conditions**

Claudio Ferragine, Livio Cricelli, Nathan Leviaidi,  
 Francesca Di Pillo  
*University of Tor Vergata, Italy*  
*University of Cassino, Italy*

**Simulation of 2-Dimensional Torus Networks**

Chang-Shyh Peng  
*California Lutheran University, USA*

**Impact of Wavelet Decomposition Levels on Watermarking Robustness and Invisibility**

Mohammad S. Obaidat, Monmouth University, USA.  
 M. Suhail, University of Bradf, United Kingdom

**TRACK: VERIFICATION VALIDATION & ACCREDITATION**

**Chairs:**

**Lou Birta, MISS - Ottawa Center, ON Canada**  
**Simone Youngblood, DMSO, USA**

**Session 1: VV&A**

Tuesday 22 July 2003 Room 1  
 1:30 pm - 3:00 pm  
**Chair: Lou Birta, MISS - Ottawa Center, ON Canada**

**Research Issues in Verification and Validation from Foundations'02**

D. E. Stevenson, *Clemson University, USA*

## Simulation Validation Qualitative Assessment Process Improvement

Dale K. Pace, JHU/APL, JWAD, USA

## From DEVS to Formal Methods

D. E. Stevenson, *Clemson University, USA*

## Verification & Validation Program at Lawrence Livermore National Laboratory: Goals, Methods, Levels, and Metrics

Roger W. Logan, Cynthia K. Nitta, Lawrence Livermore National Laboratory, USA

## Session 2: VV&A

Tuesday Room 1 3:30 pm - 5:00 pm

Chair: Simone Youngblood, DMSO, USA

## From High-level Specifications to Event Graphs

Dale K. Pace, JHU/APL, JWAD, USA  
Norbert Giambiasi, LSIS, POLYTECH, France  
Géraldine BLANC, Jean-Luc PAILLET, LSIS, CMI, France

## Tailoring Verification, Validation and Accreditation of Models & Simulation Systems: Canadian DND/CF Approach

Orhun O. Molyer, *TU Navy, DND/CF Synthetic Environment Coordination Office, Canada*  
Andrew L. Vallerand, *DND/CF, DND/CF Synthetic Environment Coordination Office, Canada*

## Towards a Metric Suite for Discrete Event Trace Validity

Levent Yilmaz, *Trident Systems Incorporated, USA*

## Session 3: VV&A

Tuesday Room 2 10:30 am - 12:00 pm

Chair: Lou Birta, MISS - Ottawa Center, ON Canada

## Practical Application of Formal Methods in Modeling and Simulation

David Richard Kuhn, National Institute of Standards and Technology, USA  
Dan Craigen, Mark Saaltink, ORA Canada, Canada

## Human Performance Model Validation: One Size Does Not Fit All

Michael J Young, Air Force Research Laboratory, USA

## Validating Human Behavioral Models for Combat Simulations Using Techniques for the Evaluation of Human

## Performance

Simon R Goerger, Naval Postgraduate School, USA

## VV&A for Innovative Concept Design in New Vessels Simulation and Virtual Prototypes

Agostino Bruzzone, Roberto  
*University of Genova, Italy*

# VIRTUAL REALITY, VISUALIZATION AND SIMULATION

## Chairs: Marielle Den Hengst, TU Delft, NL

Carlos Luis N. dos Santos, UFRJ/COPPE/PEC/LAMCE, Brasil

## Session 1: VR, Visualization and Simulation

Tuesday Room 6 10:30 am - 12:00 pm

Chair: Carlos Luis N. dos Santos, UFRJ/COPPE/PEC/LAMCE, Brasil

## User Behavior in 3D Videoconferencing Applications

Mojtaba Hosseini, Nicolas Georganas  
*DISCOVERLab, University of Ottawa, Canada*

## Animation Model to Support Exploratory Analysis of Dynamic Environments

Jorge A Campos, Max J Egenhofer, Kathleen Hornsby  
*University of Maine, USA*

## Character and Language of Scientific Visualization: Applications in Medicine

Klaus de Geus, José H Dometerco, Cássio A Rúbio  
*Copel Tecnologia da Informação, Brazil*

## Session 2: VR, Visualization and Simulation

Tuesday Room 6 1:30 pm - 3:00 pm

Chair: Carlos Luis N. dos Santos, UFRJ/COPPE/PEC/LAMCE, Brasil

## Logistics Cooperative Functional Training System based on HLA Distributed Simulation

Agostino Bruzzone, Roberto Mosca, Simone Viazzo  
*University of Genova, Italy*  
Chiara Briano, Marina Massei  
*Liophant Simulation Club, Savona, Italy*  
Matteo Brandolini, Attilio Rocca  
*BRB Studio, Italy*

## Visualization of Data Filtered by Mathematical Formulations

Djalma Silva, *Universidade Tuiuti do Paraná, Brazil*  
Klaus de Geus, *Universidade Federal do Paraná, Brazil*



### Collaborative Immersive Visualization Environments at Oil Companies

Carlos Luiz Nunes Dos Santos, Giuseppe Bacoccoli, Luiz Landau  
COPPE/UFRJ, Brazil

### Session 3: VR, Visualization and Simulation

Tuesday Room 6 3:30 pm - 5:00 pm

Chair: Carlos Luis N. dos Santos, UFRJ/COPPE/PEC/LAMCE, Brasil

### The Use of Innovative Technologies in the Case of the Space Reduction in Urban Environment: Study of a Lane Keeping System

Jean-Michel Auberlet, Antonino Tripoldi,  
Stéphane Espie, Domenico Gattuso  
INRETS, MSIS, ARCUEIL, France

### Visualization and Simulation for Restoration of Historical Monuments Through Virtual Heritage

Victorino Oliveira Neto, Carlos Luiz Nunes dos Santos  
UFRJ, Brazil

### Virtual Reality as a Training Tool in a Hospital Simulation

Ludmila Gabcan, Carlos Santos, Luiz Landau  
COPPE/UFRJ, Brazil

### 3D Visualization of Airport Ground Information

### Student Workshop

Chairs: Peter Kropf, University of Montreal, Canada  
Ling Rothrock, Penn State University, USA

### Session 1: Student Workshop

Monday Room 6 10:30 am - 12:00 pm

Chair: Peter Kropf, University of Montreal, Canada

### Formal Methods in the Verification and Validation of Simulation Models

Ken Kennedy  
Clemson University, USA

### Generation of DEVS Modelling and Simulation Environments

Ernesto Posse, Jean-Sebastien Bolduc, Hans Vangheluwe  
McGill University, Canada

### A Virtual Machine Supporting Multiple Statechart Extensions

Huining Feng, Hans Vangheluwe  
McGill University, Canada

### Session 2: Student Workshop

Monday Room 6 1:30 pm - 3:00 pm

Chair: Ling Rothrock, Penn State University, USA

### Applying Cell-DEVS in models of complex systems

Gabriel A Wainer, Javier Ameghino  
Carleton University, Canada  
Ezequiel Glinsky, Universidad de Buenos Aires, Argentina

### Modelling a sand pile application using Cell-DEVS

Gabriel A Wainer, Hesham Saadaw  
Carleton University, Canada

### Modeling of Maze-Solving Systems using Cell-DEVS

Gabriel A Wainer, Kevin Lam  
Carleton University, Canada

### Session 3: Student Workshop

Monday Room 6 3:30 pm - 5:00 pm

Chair: Peter Kropf, University of Montreal, Canada

### A Multiagent Frigate Movement Survival Approach

P. Plamondon, Brahim Chahib-draa, Patrick Beaumont, Dale Blodgett, Peter Kropf, Laval Univeristy, Canada.

### Implementing Finite State Machines Using the CD++ toolkit

Gabriel A Wainer, Tao Zheng  
Carleton University, Canada

### Transforming Statecharts to DEVS

Spencer C Borland, Hans Vangheluwe  
McGill University, Canada

### Student Workshop Overview

Monday Room 6 5:30 pm - 6:30 pm

Chairs: Peter Kropf, University of Montreal, Canada  
Link Rothrock, Penn State University, USA

### SCS International Technical Council Workshop: SIMPLEST (SIMulation applications in Management, PLanning & forEcaSTing)

Chairs: Agostino Bruzzone, DIP, Italy  
Marina Massei, Liophant Simulation Club

### Session 1: SIMPLEST

Monday Room 5 1:30 pm - 3:00 pm

Chair: Agostino Bruzzone, DIP, Italy

### Specifying and Simulation of Reactive Knowledge Based Systems

Claudia Frydman, Lucile Torres, Aguinaldo Garrido de Ceita  
LSIS, France

**A Supervised Multi-Agent Architecture for APS in multi-site production systems for demand validation and evaluation**  
Flavio Tonelli, Filippo Queirolo, University of Genoa, Italy  
Massimo Bernocco, ATOMOS, Italy  
Maurizio Schenone, Politecnico di Torino, Italy

**Application of Simulation to Small Enterprise Management & Logistics**  
Simone Simeoni, DIP University of Genoa, Italy  
Marina Massei, Liophant Simulation Club, Italy

**Session 2: SIMPLEST Council Meeting**  
Monday Room 5 3:30 pm - 5:00 pm  
Chair: Agostino Bruzzone, DIP, Italy

**Session 3: SIMPLEST Invited Talk: AI & Simulation**  
Tuesday Room 6 10:30 am - 12:00 pm  
Chair: Agostino Bruzzone, DIP, Italy  
Speaker: Claude Frasson, University of Montreal, Canada

**LESNEX Workshop**  
(Lean Simulation Network of Excellence)  
Chair: Stefano Saetta, University of Perugia, Italy

**Session 1: LESNEX**  
Tuesday Room 5 3:30 pm - 5:00 pm  
Chair: Stefano Saetta, University of Perugia, Italy

**Modeling and Simulation of the Supply Chain: A Problem of Preventative Trans-shipment**  
Stefano Saetta, Lorenzo Tiacchi  
*Università degli Studi di Perugia, Italy*

**A Methodology to Reduce Data Collection in Lean Simulation Modelling for the Assembly Line Balancing Problem**  
Stefano Saetta, Lorenzo Tiacchi, Andrea Martini  
*Università degli Studi di Perugia, Italy*

**An application of a finite MRP procedure based on simulation**  
Tommaso Rossi, University LIUC, Italy  
Nicola Saccani, University of Brescia, Italy  
Luigi Uglietti, Politecnico di Milano, Italy

**Session 2: LESNEX Panel Discussion**  
Tuesday Room 5 5:30 pm - 7:00 pm  
Chair: Agostino Bruzzone, DIP, Italy

**Standards Workshop**  
Chair: Stephen J. Swenson, US Navy, USA  
Peggy Gravitz, AEGIS Technologies Group Inc., USA

**Session 1: Standards**  
Wednesday Room 1 10:30 am - 12:00 pm  
Chair: Peggy Gravitz, AEGIS, USA

**Discrete Event Modeling and Simulation of Distributed Architectures using the DSSV Methodology**  
Fabrice Bernardi, Emmanuelle De Gentili, Jean-François Santucci  
*University of Corsica, France*

**Domain Management in a Hierarchical Generic Models Library**  
Fabrice Bernardi, Jean-François Santucci  
*University of Corsica, France*

**The Layer of Interest Oriented To HLA**  
Zhong Zhou, Qingping Zhao  
*Beihang University, China*

**Session 2: Standards**  
Wednesday Room 1 1:30 pm - 3:00 pm  
Chair: Stephen J. Swenson, US Navy, USA

**A Comparative Analysis of UML and IDEF0 for Modeling and Simulation**  
Brian Goldiez, Jose A Sepulveda  
*University of Central Florida, USA*

**Hybrid System Modeling Using Generalised Discrete Event Specification G-DEVS**  
Abdelaziz Naamane, Norbert Giambiasi,  
*Ecole Polytechnique Universitaire De Marseille, France*  
Sumit Ghosh, Stevens Institute of Technology, USA

**Towards a UML Profile For HLA Federation Design, Part II**  
Okan Topcu, Mark Hazen  
*Defense Research and Development, Canada*  
Halit Oguztuzun, Middle East Technical University, Turkey

**Session 3: Standards Panel Discussion**  
Wednesday Room 1 3:30 pm - 5:00 pm  
Chairs: Stephen J. Swenson, US Navy, USA  
Peggy Gravitz, AEGIS Technologies Group Inc., USA

## International Symposium on Performance Evaluation of Computer and Telecommunications Systems Simulation Conference 2003

### General Chair

Mohammad S. Obaidat, Monmouth University, USA

### Senior Program Chair

Franco Davoli, DIST-University of Genoa, Italy

### Program Co-Chairs

Ibrahim Onyuksel, N. Illinois Univ., USA

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### Vice Program Chair and Tutorial Chair

Raffaele Bolla, DIST-University of Genoa, Italy

### Vice Program Chair and Web Master

Imad Mahgoub, Florida Atlantic University, USA

### Industrial Track Chair and Special Sessions Chair

J. Fox, Motorola, Inc., UK

## TRACK 1

Monday, 10:30 a.m. – 12 p.m.

### TCP

#### A Simulation Study of the Interoperability of TCPW with RED and ECN

Sean Shao, Medy Sanadidi, Mario Gerla  
UCLA, USA

#### Dynamic Bandwidth Allocation for Lifetime-Based TCP Classification

Xudong Wu, Ioanis Nikolaidis  
University of Alberta, Canada

#### Origin of Self-similarity in TCP traffic

Kensuke Fukuda, NTT, Japan  
Misako Takayasu, Future-University Hakodate, Japan.  
Hideki Takayasu, Sony Computer Science Laboratories, Japan

#### Simulation based analysis of completion time distribution for short-lived TCP flows

Matteo Sereno, University of Torino, Italy

#### Making SCTP More Robust to Changeover

Janardhan R. Iyengar, Armando L. Caro, Paul D. Amer, Gerard J.

Heinz, Randall R. Stewart  
University of Delaware, Newark, DE, USA.  
Cisco Systems, Inc., USA

Monday, 1:30 p.m. -3:00 p.m.

### Optical Networks

#### Resilient Lightpath Provisioning with Multiple Criteria in All-Optical Wavelength Routed WDM Networks

Hussein T. Mouftah, University of Ottawa, Ontario, Canada

#### An Integrated Routing and Wavelength Assignment Scheme in WDM Networks

Ying Zhang, Gargi Banerjee, Deepinder Sidhu,  
University of Maryland, Baltimore, USA

#### A Novel Self-routing Strategy for All-optical Packet Switched Multiprocessor Systems

Ekpe Okorafor, Mi Lu, Texas A&M University, USA

#### An Automatic Alternative Route Selection (AARS) Scheme for GMPLS Based Wavelength Routed Optical Network

Chen Gong, Ngho L Heng, Ananda L Akkihebbal, Cheng H Seng,  
Institute for Infocomm Research, Singapore

#### WRONSIM - A Simulation Tool for the Performance Evaluation of Resource Reservation Protocols in Wavelength- Routed Optical Networks

Hussein T. Mouftah, University of Ottawa, Ontario, Canada

Monday, 3:30 p.m. -5:00 p.m.

### MPLS

#### Performance Testing Methodology of MPLS Signalling Protocols

Hussein T. Mouftah, University of Ottawa, Ontario, Canada

#### Protection Performance Components in MPLS Networks

Eusebi Calle, Jose L Marzo, Anna Urra,  
Universitat de Girona, Spain

#### Capacity Planning of MPLS Networks

Mai Hoang, University of Potsdam, Germany

#### Efficient CRM for QoS Routing in MPLS Networks

Connie M. C. Yuen, Lawrence C. C. Cheung  
City University of Hong Kong, China

## TRACK 2

Tuesday, 10:30 a.m. – 12 a.m.

### WLANs

#### Supporting VoIP Traffic in IEEE 802.11 WLAN with Enhanced Medium Access Control (MAC) for Quality of Service

Dongyan Chen, Kishor Trivedi, *Duke University, USA*  
Sachin Garg, *Avaya Labs Research, USA*

#### Dynamic Waveform-Power Adaptation in Mobile 802.11 Wireless LANs

Mohammad S. Obaidat, David B. Green  
*Monmouth University, USA.*

#### An Implementation Study of Multicast Extensions of AODV

Manish Karir, Dinesh Dharmaraju, John Baras  
*Center for Satellite and Hybrid Communication Networks, USA*  
Subir Das, *Telcordia Technologies, USA*

#### HIPERSIM: A Sense Range Distinctive Simulation Environment for HiperLAN Networks

Georgios I. Papadimitriou, Thomas Lagkas, Andreas S. Pomportsis  
*Aristotle University, Thessaloniki, Greece*

Tuesday, 1:30 p.m. -3:00 p.m.

### Wireless I

#### ATM Cell Discarding Probability over a Rayleigh Fading Channel

Sebastià Galmés, Miquel Font, Ramon Puigjaner  
*University of the Balearic Islands, Spain*

#### Delay performance analysis and simulation of real-time applications in GPRS networks

Tim Irnich, Dimitri Eges  
*Aachen University, Germany*

#### A New Model For Traffic Forecast in Wireless Networks with Fast Mobile Users

Raffaele Bolla, Matteo Repetto, *University of Genoa, Italy*

3:30 p.m. - 5:00 p.m.

## WIRELESS II

Comparing Load Adaptive Inter-Piconet Scheduling

28

#### Algorithms: A Simulation Study

Vojislav B. Mistic, Jelena Mistic, Ka Lok Chan  
*The Hong Kong University of Science and Technology, Hong Kong*

#### A Novel CAC Strategy for Multimedia Traffic in Wireless Mobile Networks

Nagla O. Mohamed, Dervis Z. Deniz  
*Eastern Mediterranean University, Turkey*

#### Teletraffic Distribution in Future Wireless Networks

Ronald Beaubrun, *University of LAVAL, Canada*  
Samuel Pierre, Jean Conan  
*École Polytechnique de Montréal, Canada*

#### Diagnosing Wireless TCP Performance Problems: A Case Study

Tianbo Kuang, Fang Xiao, Carey Williamson  
*University of Calgary, Canada*

## TRACK 3

10:30 a.m. – 12 p.m.

### Queueing

#### Modeling and Analysis for the Continuous-time Finite Queueing System M/M/1/L/c

Guoping Zeng, *University of Texas at Dallas, USA*  
Imrich Chlamtac, *University of Texas at Dallas, USA*  
Yuguang Fang, *University of Florida, USA*  
Yuqiang Wu, *Qufu Normal University, China*

#### On Average and Worst Case Behaviour in Non-Preemptive Priority Queueing

Jens B Schmitt, *University of Technology, Darmstadt, Germany*

#### Analytical formulas for the variance of on-line queueing estimations and for the batch size needed and their applications to teletraffic multiplexing

Michael Shalmon, *Univ. Quebec-INRS, Canada*

## NETWORK SIMULATION

1:30 p.m. -3:00 p.m.

Lightweight TCP/IP Simulator for Performance Studies and



### Optimization Based Network Control

Przemyslaw Jaskola, Krzysztof Malinowski  
*Warsaw University of Technology, Poland*

### A Call-level Network Simulator Framework based on a Standard Agent Platform

Santiago Cots, Jové Teodor, Vilà Pere  
*Universitat de Girona, Spain*

### Distributed Emulation of Shared Media Networks

Daniel J Herrscher, Steffen D Maier, Kurt Rothermel  
*University of Stuttgart, Germany*

## Special Session: Modeling and Simulation-Based Multiprocessor Scheduling

### CPNSim: A Computational Process Network Simulator

Fabricio A Silva, UFRJ, NCE, Brazil.  
Flávio S. Mendes, Eliana P. Aude, Ernesto P. Lopes,  
Marcela M Silva, Henrique Serdeira, Silveira Julio, Mario Martins  
*Catholic University of Santos, Brazil*

### On the extensibility properties and performance measures of circuit switched telecommunication networks, using agent-based distributed routing algorithm

Constandinos X. Mavromoustakis, Helen D. Karatza,  
*Aristotle University of Thessaloniki, Greece*

### A New Two-step Approach for Scheduling Large Parallel Programs

Concepció Roig, *University of Lleida, Spain*  
Ana Ripoll, Emilio Luque  
*Univ. Autònoma of Barcelona, Spain*

### Scheduling Distributed Server Systems with Highly Variable Processing Times

Douglas Down, Rong Wu  
*McMaster University, Hamilton, Ontario, Canada*

## TRACK 4

10:30 a.m. – 12 a.m.

### Performance Modeling and Measurements I

#### A Performance Study of Chip Multiprocessors with Integrated DRAM

Linda Wang, *McGill University, Canada*  
Naraig Manjikian, *Queen's University, Canada*

#### A Performance Study of System-on-Chip Network Processor Architecture

Xuetao Li, Naraig Manjikian, *Queen's University, Canada*

#### New Multicast Algorithms in Mesh-connected Networks

Hovhannes Harutyunyan, Liu Xiaolin  
*Concordia University, Canada*

#### A Novel Performance Metric for Evaluation of Computer System Heterogeneity

Kalinka Regina Lucas Jaquie Castelo Branco,  
Marcos José Santana, Regina Helena Carlucci Santana  
*University at São Paulo, Brazil*

#### Multi-level RAID Storage System Modeling

Soraya Zertal, Peter Harrison, *Universite de Versailles, France*

1:30 p.m. -3:00 p.m.

### Performance Modeling and Measurements II

#### On the Sensitivity of Cooperative Caching Performance to Workload and Network Characteristics

Kang-Won Lee, Khalil Amiri, Sambit Sahu,  
Chitra Venkatramani  
*IBM Research, USA*

#### A Measurement Based Memory Performance Evaluation of High Throughput Servers

Yau Isa Garba, Abdul Waheed  
*King Fahd University of Petroleum and Minerals, Dhahran, Saudi  
Arabia*

#### Modeling and Analysis of Memory System Performance of Network Infrastructure Applications on General-Purpose Computing Platforms

Abdul Waheed, *KFUPM, Saudi Arabia*

#### A Hardware Counter Based Tool for Application's Performance Measurement and Analysis

Yonggang Che, Zhenghua Wang, Xiaomei Li  
*National University of Defense Technology, China*

Tuesday, 8:00 a.m.-10:00 a.m.

#### Keynote Speaker 2: All Tracks

Prof. Nicolas D. Georganas, *Canada Research Chair in  
Information Technology, School of Information  
Technology and Engineering, University of Ottawa,  
Canada*

Collaborative Virtual Environments: Standards,  
Applications and Performance

**TRACK 5**

Tuesday, 10:30 a.m. – 12 a.m.

**Resource Allocation****Proactive Resource Provisioning for Voice over IP**Eric Chi, Michael Fu, Jean Walrand  
*University of California, Berkeley, USA***Extended Adaptive Resource Allocation for Satellite Channels**

Mario Marchese, Igor Bisio, CNIT – University of Genoa Research Unit, Genoa, Italy

**LP Based Approach to Bandwidth Management on a Network: Simulation**

Mohd Abdul Saifullah, Indian Institute of Technology Madras, Chennai, Tamil Nadu, Malaysia

**Derivative Estimation and Optimization of Loss Probability in Satellite Packet Networks**Maurizio Mongelli, Stefano Canesi ,  
Davoli Franco, Mario Marchese  
*DIST - University of Genoa, Italy*

Tuesday, 1:30 p.m. -3:00 p.m.

**QoS I****MIG11 Priority Scheduling with Discrete Preemption Points - On the Impacts of Fragmentation on IP QoS**Markus Fidler, *RWTH Aachen, Germany***Improving Node Behavior in a QoS Control Environment for Local Broadcast Networks**Bernd E. Wolfinger, Jürgen Wolf  
*University of Hamburg, Germany*  
Gwendal Le Grand, *Telecom Paris, France***Optimal Resource Allocation for a Differentiated Service System with Three Classes of Traffic**Attahiru S Alfa, K. P. Sapna Isotupa  
*University of Manitoba, Winnipeg, Manitoba, Canada.*  
Wilfrid Laurier, School of Business & Economics, Waterloo, Canada**Implementation Scheme for Reliable Multi-session Multicast****by using Proactive Hybrid FEC/ARQ Technique**Ji Li, Qingfeng Xu, Elhakeem K Ahmed  
*Concordia University, Canada*  
Maria Bennani, Kadoch Michelle, *Universite du Quebec, Canada*

Tuesday, 3:30 p.m. -5:00 p.m.

**QoS II****Network Quality of Service Measurement System for Application Requirements Evaluation**Mihail L Ivanovici, Razvan Beuran, Bob Dobinson  
*CERN, Switzerland*  
Neil Davies, *U4EA Technologies Limited, United Kingdom***Efficient QoS Scheme for Voice Traffic in Converged LAN**Yoon Suk Choi, Jong-Kwon Lee , Tag Gon Kim, Kyou Ho Lee  
*Korea Advanced Institute of Science and Technology, Korea***FTP – QoS Enabled Architecture: a proposal**Mario Marchese, Luca Caviglione, Tomaso De Cola  
*CNIT - Italian National Consortium for Telecommunications, University of Genoa, Italy***TRACK 6****Ad Hoc Networks****Quality of Service Routing in Mobile Ad Hoc Networks**Hussein T. Mouftah, *University of Ottawa, Ontario, Canada.***Analysis of the Effects of Entity Mobility Models on Ad Hoc Network Communication**Jorge Raul Nuevo, Jean-Charles Gregoire  
*Universite du Quebec, Canada***Adaptive Multi-path Routing Scheme for QoS Support in Mobile Ad-hoc networks**Herman Hughes, Hongxia Sun  
*Michigan State University, USA***On the Performance of TCP VEGAS in Mobile Ad Hoc**

## Networks

Mohamed Ould-Khaoua, Stylianos Papanastasiou,  
*University of Glasgow, United Kingdom*

**Tuesday, 1:30 p.m. -3:00 p.m.**

### Congestion Control I

#### Balanced Queue Sizes for Arbitrary Loads with a Load-adapting RED Function

Erich Plasser, Thomas Ziegler  
*Telecommunication Research Center, Austria*

#### Performance Evaluation of Multi-rate Multicast Congestion Control Protocols: FLID-DL vs. PLM

Somnuk Puangpronpitag, Roger Boyle, Karim Djemame  
*University of Leeds, United Kingdom*

#### A Combination of ERICA+ and Distributed WPMM Algorithms to Guarantee the Minimum Cell Rate for ABR Service in ATM Networks

Quan Trung Le  
*Ho Chi Minh City University of Technology, Vietnam*  
Erke Tapio, *Asian Institute of Technology, Thailand*

**Tuesday, 3:30 p.m. -5:00 p.m.**

### Congestion Control II

#### Simulation-based Study of ECN Performance in RED Networks

Marek M. Malowidzki, *Military Communication Institute, Poland*

#### Design of TCP Traffic Controllers for AQM Routers Based on Gain Margin Specification

Yang Hong, Oliver W.W. Yang,  
*University of Ottawa, Canada*

#### A Novel Fuzzy Based Active Queue Management Algorithm

Mohammad Hossien Yaghmaee  
*Ferdowsi University of Mashhad, Khorasan, Iran*

## TRACK 7

**Tuesday, 10:30 a.m. – 12 a.m.**

### Traffic Modeling and Characterization

#### Timescales in models for bursty traffic

Kathleen Spaey, Tom Hofkens, Chris Blondia  
*University of Antwerp, Belgium*  
Danny De Vleeschauwer, *Alcatel Bell, Belgium*

#### A Detection Technique for Atypical Wide-Area Network Traffic

Carl Minton, *Arion Systems, Inc., USA*  
Scott F Midkiff, *Virginia Tech, USA*

#### MLTG Traffic Re/Generator

Fakhri Moatemri, Jean-Charles Gregoire  
*INRS EMT, Canada*

#### Traffic Splitting and Its Application to Network-Wise Performance Analysis

Huei-Wen Ferng, Cheng-Ching Peng  
*National Taiwan University of Science and Technology, Taiwan*

**Tuesday, 1:30 -3:00 pm**

### Special Session: Composite QoS Metrics and Cognitive Networks

#### A Power-Aware Routing Algorithm

Erol Gelenbe, Lent Ricardo  
*University of Central Florida, USA*

#### Using Loss and Delay as QoS Goals

Erol Gelenbe, Michael Gellman, Pu Su  
*University of Central Florida, USA*

#### Traffic Engineering With Cognitive Packets

Arturo Nunez, Erol Gelenbe  
*University of Central Florida, Orlando, FL, USA*

#### Genetic Algorithms for Route Discovery

Erol Gelenbe, Peixiang Liu  
Jeremy Laine  
*University of Central Florida, Orlando, FL, USA*  
*Ecole Polytechnique, France*

3:30-5:00 pm

**Special Session: Design and Performance Evaluation  
of Group Communication in Parallel and Distributed  
Systems**

**Core-Based Approach in Multicast Routing Protocols**

Ayse Karaman, Hossam Hassanein  
Queen's University, Kingston, ON, Canada

**On Balancing Traffic Load in Path-Based Multicast  
Communication**

A. Al-Dubai, M. Ould-Khaoua, L. Mackenzie  
University of Glasgow, UK  
K. El-Zayyat, DePaul University, Chicago, IL, USA

**Collective Communication in DECK Parallel  
Programming Environment**

Rafael Silva, Marcos Barreto, Rafael Ávila, Philippe Navaux  
Institute of Informatics-UFRGS, Porto Alegre-RS, Brazil

**A General Analytical Model of Adaptive Wormhole Routing  
in k-Ary n-Cube**

**Interconnection Networks**  
Khonsari, M. Ould-Khaoua  
University of Glasgow, UK  
John Ferguson  
University of Strathclyde, UK

**Understanding Data Distribution Management in Large-  
scale Distributed  
Simulations**

Azzedine Boukiriche, Caron Dzermajko  
University of North of Texas, USA

Wednesday, 8:30 a.m.-10:00 a.m.

**Keynote Speaker 3: All Tracks**

**Prof. Alexander Thomasian, Computer Science Dept.,  
New Jersey Institute of Technology, USA  
Storage Systems and Their Performance Analysis**

12:00 Noon-1:30 p.m.

**Keynote Speaker 4 (Luncheon Speaker)**

**Thomas H. Buscaglia, Senior Partner and Principle,  
H. Buscaglia and Associates, Miami, FL, USA**

## TRACK 8

Wednesday, 10:30 a.m. – 12 a.m.

### Fault-Tolerant System

**Evaluating the Dynamic Behavior of Performance Metrics  
of E-Commerce Fault-Tolerant Cluster Servers Using the  
TPC-W Benchmark**

Daniel F. García, Javier García, Carlos López,  
Iñigo Canga, Diego González  
*University of Oviedo, Spain*

**Performance of Two Disk Failure Tolerant Disk Arrays**

Alexander Thomasian, Chunqi Han  
*New Jersey Institute of Technology, USA*

**Mirrored Disk Scheduling**

Alexander Thomasian, Junilda Spirollari, Chang Liu, Chunqi Han,  
Gang Fu, New Jersey Institute of Technology, USA

**A Fast, Accurate and Reliable Estimation for Rapid Design  
Space Exploration of Superscalar Architecture**

Seung Bae Jee, Yeong Geol Kim, Tag Gon Kim  
*Korea Advanced Institute of Science and Technology, Korea*

**Optimal Fault-Tolerant One-to-all Broadcasting and Efficient  
Fault-Tolerant All-to-all Communication  
Protocol in Honeycomb Networks**

David SEME, *Université de Picardie Jules-Verne, France*

Wednesday, 1:30 p.m. - 3:00 p.m.

### Distributed Systems

**Simulation Study on Clustered OLTP Systems Using TPC-C  
Workload**

Hong Cai, Hisao Kameda, Jie Li  
*University of Tsukuba, Japan*

**A New Approach fo Acquiring Knowledge of Resource Usage  
in Parallel Applications**

Luciano José Senger  
Universidade Estadual de Ponta Grossa, Paraná, Brazil  
**Marcos José Santana**  
**Regina Helena Carlucci Santana**  
Universidade de São Paulo, São Carlos, São Paulo, Brazil

**A Matching Algorithm for CIOQ switches with Multiple  
Levels of Service**

Tsern-Huei Lee, Ying-Che Kuo  
*National Chiao-Tung University, Taiwan*



## Performance Analysis of DIN Cache for Data Access in Distributed System

Ligang Dong, *Institute for Infocomm Research, Singapore*

**Wednesday, 3:30 p.m. - 5:00 p.m.**

### Web Performance

#### A Fuzzy Algorithm for Web Caching

Maria Carla Calzarossa, Giacomo Valli, *Università di Pavia, Italy*

#### Network-Level Impacts on User-Level Web Performance

Carey L Williamson, Nayden M Markatchev  
*University of Calgary, Canada*

#### The Distribution of File Transmission Duration in the Web

Ronit Nossenson, Hagit Attiya, *Technion, Israel*

#### Analysis of Task Scheduling Algorithms in Distributed Web-server Systems

Mario M Teixeira, *UFMA, Brazil*

## TRACK 9

**Wednesday, 10:30 a.m – 12 a.m.**

### Network Design

#### NETCAP: A Capacity Planning Tool for Practical Content Distribution Network Designs

Sami J Habib, *Kuwait University, Kuwait*

#### Robust Network Provisioning

Vladimir Marbukh, NIST, ANTD, Gaithersburg, USA

#### Design of TMN Systems Using Interrupted Arrival Poisson Process and Simulation: A Case Study

Young Ha Hwang  
*Electronics and Telecommunications Research Institute, Korea*  
Gum Il Lee, Sang Wook Chung  
*Chonnam National University, Korea*  
Gil Haeng Lee  
*Electronics and Telecommunications Research Institute, Korea*

#### Performance Comparison of Resilient Packet Ring (RPR), Packet over SDH/SONET (POS) and Gigabit Ethernet (GE) for network design

Yew Fai Wong, Chiang Yoon Wong, Lek Heng Ngho

*National University of Singapore, Singapore*

**Wednesday, 1:30 p.m. - 3:00 p.m.**  
**Special Session: Mobile Computing**

**Organizer: Imad Mahgoub, Florida Atlantic University, USA**

**Chair: TBD**

#### Simulation-based Analysis of Bluetooth Networks

M. Subramani, M. Ilyas  
*CSE, Florida Atlantic University, USA*

#### Mobility Pattern Based Routing Algorithms for Mobile Ad Hoc Wireless Networks

N. Vyas, I. Mahgoub  
*CSE, Florida Atlantic University, USA*

#### A Multi-tier Ubiquitous Service Discovery Protocol for Mobile Client

C. Lee, A. Helal  
*CISE, University of Florida, USA*

#### Evaluation of Usage Scenarios in Mobile People Architecture

H. Shang and I. Mahgoub  
*CSE, Florida Atlantic University, USA*

**Wednesday, 3:30-5:00 pm**

### Security and Data Correctness

**Chair: TBD**

#### Communication Asynchrony and Data Timeliness Issues for Secure Voting in Distributed Sensor Systems

Kevin A Kwiat, Pat Hurley, Air Force Research Laboratory, USA  
Kaliappa Ravindran, Ali Sabbir  
*City University of New York, New York, NY, USA.*

#### SPKI-based Trust Management in Communications Networks

Mohammad S. Obaidat, Monmouth University, USA  
Noureddine A. Boudriga, Digital Certification Agency, Tunisia

#### 'Timed Atomic Write': a Programming Primitive for Distributed Real-time Information Systems

Kaliappa Ravindran, Ali Sabbir, City University of New York, USA.  
Kevin A Kwiat, Air Force Research Laboratory, USA

## TRACK 10

Wednesday, 10:30am – 12:00 pm

### Software Performance

#### **A Fuzzy Model for Measurement of Software Understadability**

Krishan K. Aggarwal, Yogesh Singh, Jitender Kumar Chhabra\*,  
Guru Govind Singh Indraprastha University, India

#### **Abstract Syntax Notation One (ASN.1) vs. eXtensible Markup Language (XML) – A Performance Comparison**

Darren P Mundy, David W Chadwick  
Salford University, ISI, United Kingdom  
Andrew Smith, Salford Software, United Kingdom

#### **Enhancing the Performance of OpenLDAP Directory Server with Multiple Caching**

Jong Hyuk Choi, Hubertus Franke, *IBM, USA*  
Kurt D Zeilenga, *OpenLDAP Foundation, USA*

#### **The Effects of Memory-Rich Environments on File System Microbenchmarks**

An-I Andy Wang, Peter Reiher, Gerald J Popek, *UCLA, USA*  
Geoffrey Kuenning, *Harvey Mudd College, USA*

### Network Performance I

#### **Exact Aggregation Strategies for Semi-Markov Performance Models**

Jeremy T. Bradley, Nicholas J. Dingle, William J. Knottenbelt  
*Imperial College London, United Kingdom*

#### **Managing a Heterogeneous Network using a General End-To-End Management Framework and Ideas from the Multiservice Switching Forum**

Wolfgang Haidegger, *Siemens, Austria*

### Network Performance II

#### **Towards More Fixed Identity for Internal Hosts Behind NAT Routers**

Mohammad A. Awad, Yasser H. Dakroury

*Ain Shams University, Egypt*

#### **An Adjustment Algorithm: A New Effective Service Rate Approach for RR Schedulers**

John Tsiligaridis, Raj Acharya, *S.U.N.Y at Buffalo, USA*

#### **Improving DCOM Communication for Automation Environments**

Marcus Thoss, Reinhold Kroeger, Fachhochschule Wiesbaden,  
*Univ. of Applied Sciences, Germany*  
Georg Biehler, *Siemens AG, Germany*

International Conference on Information  
Systems and Engineering 2003

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NOUREDINE MELAB, POLYTECH'LILLE, FRANCE

## S1: Agent-Based Systems and Designs

### Inter-Domain Diffserv Dynamic Provisioning and Interconnection Peering Study using Bandwidth Management Point — A Simulation Evaluation

Junseok Hwang and Rajesh Revuru  
Syracuse University, USA

### Emotion-based Control Mechanisms for Agent Systems

Charles Hannon, Texas Christian University, USA

### Implementation of a Multi-agent System within a Diffserv Nnetwork to Improve its Performance

Nada Meskaoui, Dominique Gaiti and Karim Kabalan  
American University of Beirut, Lebanon

### A New General, Flexible and Java-Based Software Development Tool for Multiagent Systems

Tony Garneau and Sylvain Delisle  
UQTR, Canada

### The Self-Discipline Guarantee Architecture in Distributed System Integration

Xu Jin and Kinji Mori  
Beijing Institute Technology, China

### Aeronautical Mobile Data Management Using Agent Technology

Wathiq Mansoor and Zakaria Maamar  
Zayed University, United Arab Emirates

## S2: IS Reliability, Fault Tolerance, Security and Authentication

### Multi-layer Watermarking in Closed Information Systems

Mariofanna Milanova, Charles Ford, Roumen Kountchev, Stuart Rubin, and Roumiana Kountcheva  
UALR, USA

### Policy-based managed and Integrated Security Router (PISER)

Jong-Gook Ko, Jeong-Nyeo Kim, Sung-Won Sohn  
ETRI, Korea

### The Implementation of Trusted Channel between Secure Operating Systems

Joonsuk Yu, Jaedeok Lim, Jaehoon Nah, Taekyong Nam, and Sungwon Sohn

### Global Approach for Fraud Management Architecture in Telco

Oleg Golobrodsky, Guy Zamir  
Bar Ilan, Israel

## S3: Object-based and Object-Oriented Modeling and Simulation

### Defining DFD Meta Model Using UML

Masataro Shiroiwa, Takao Miura, Shioya Isamu  
HOSEI University, Japan

### Multimodal Transportation Networks: Object Modeling and the K-Multimodal Shortest Path

Hicham Mouncif and Azedine Boulmakoul  
FST Mohammedia, Morocco

### Object Oriented Approach and Java-based Distributed Simulation for Container Terminal Operational Management

M. Rida, FST Mohammedia, Morocco  
A. Boulmakoul, 2INSA of Lyon, France

## S4: Web Services and Service-based Approaches

### Colored Petri Net Modeling of Web Services in a Hybrid 'J2EE-Software Agent' System

Margaret Lyell, David Norris  
The MITRE Corporation, USA

### YASE: A Hyper Textual Search Engine for Individual Web Sites

Gongzhu Hu, Amrut P. Borgaonkar  
Central Michigan University, USA

## S5: Mobile and Wireless Information Systems

### Supporting Disconnected Workflow in PDA Devices

Arroyo-Sandoval Pedro, Martinez-Garcia Ana I. and Ramirez-Fernandez Cristina  
CICESE, Mexico

### **Towards an Environment of Mobile Services: Architecture and Security**

Zakaria Maamar, Hamdi Yahyaoui, Wathiq Mansoor, Arif Bhati  
Zayed University, United Arab Emirates

## **S6: Frameworks and Methods for Information Technologies**

### **An Information Quality Management Framework for Cooperative Information Systems**

Paolo Missier, Carlo Batini  
Universita' di Milano Bicocca, Italy

### **Validating a Fuzzy Resource Manager through Experiment**

James F. Smith, Naval Research Laboratory, USA

### **APN - A Petri Net Based Business Process Model**

Daniel Frauchiger, University of Fribourg, Switzerland

## **S7: e-Learning, ISE Programs, and Innovative Teaching**

### **Strategies and Tools Genesis of the New Information Systems Engineering Program at the United States Military Academy at West Point**

Gregory S. Parnell, Jean R. S. Blair, Michael D. Matthews, Curtis A. Carver Jr., Clark K. Ray  
United States Military Academy, USA

### **Information Systems and Engineering Education: Learning by Doing**

Gerardo Silva Chandía, University of Santiago, Chile

### **Teaching Software Engineering to Undergraduates**

Jacob Sukhodolsky, Saint Louis University, USA

### **Toward a Comprehensive Supplement for Language Courses**

Krishnaprasad Thirunarayan, Stephen P. Carl  
Wright State University, Computer Science and Engineering,  
Dayton, OH, USA

## **S8: Architectures for Information Interoperability**

### **A Practical Application of Enterprise Architecture for Interoperability**

John A. Hamilton, Jr., Auburn University, USA  
Glen A. Catania, Space and Naval Warfare Systems Command,  
USA

### **Two Approaches for Ontologies Building: From-scratch and From Existing Data Sources**

Djamal Benslimane, Ahmed Arara, Kokou Yetongnon, Faiez Gargouri, and Hanene Ben Abdallah  
University of Lyon, France

### **Using an Event-based Middleware in a Distributed e-Commerce Infrastructure**

E. Di Nitto, and M. Pianciamore  
CEFRIEL - Politecnico di Milano, Italy

## **S9: Integrated Information Environments and Applications**

### **Non-for-Profit and Academic Information Systems: A Case Study in Information System Reengineering**

Youry Khmelevsky  
USP, MACS, Fiji

### **Parallelizing Probability based Protein Sequence Clustering Using Intelligent Job Allocation Mechanism**

Vijay Ganesh Hariharan, Bhuvanawari  
Government College of Technology, India  
Madhusudhanan Chandrasekaran, Anusuya Venugopal  
University of Buffalo, USA



# Hotel Reservation Form

The Society for Modeling and Simulation International  
**SUMMER SIMULATION MULTICONFERENCE**  
Wyndham Montreal • Montreal, Quebec, Canada • July 20–24, 2003

## HOTEL RESERVATION FORM

Reservations must be received by June 20, 2003 to qualify for conference rate.  
Those received after this date will be accepted on a space available basis only.

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

Please reserve accommodations for:

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

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

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

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

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

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

Credit Card Number: \_\_\_\_\_

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

Room Preference:  Smoking  Non-Smoking

**Room Rate:**  Single: \$185.00  Double: \$185.00

The above rates are quoted in Canadian Dollars. Please estimate an exchange rate of 1.55 for a US equivalent of \$119.00 respectively.

Add 14.5% Hotel Tax

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

The Wyndham Montreal can only confirm your reservation request when accompanied by one night's deposit including room rate plus 14.5% sales and occupancy tax (subject to change) or company guarantee. This deposit may be made by check, money order or major credit card. If paying by check or money order, please include arrival date on the face of the check. Refunds will be made when cancellations are received no less than twenty-four (24) hours prior to your scheduled arrival date (be sure to keep your cancellation number). First night's room deposit will automatically be posted to credit card upon receipt.

***Please return this reservation request to:***  
**Wyndham Montreal**  
**1255 Jeanne-Mance Street, C.P. 130**  
**Montreal, Quebec, Canada H5B 1E5**  
**Phone: 514-285-1450**  
**Fax: 514-285-1243**

## SUMMER SIMULATION MULTICONFERENCE JULY 20–24, 2003 WYNDHAM MONTREAL • MONTREAL, QUEBEC, CANADA

This registration form must be completed and returned to the SCS office. Registration is not refundable. Full registration fee includes attendance at the conference, CD-ROM, and conference luncheon. Additional printed proceedings, tutorials, tours and social events subject to additional fees (see comprehensive registration for best value).

Name: (for badge) \_\_\_\_\_ Position: \_\_\_\_\_

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

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State/Country: \_\_\_\_\_ ZIP: \_\_\_\_\_

Business Phone: \_\_\_\_\_ Home: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

### CONFERENCE REGISTRATION OPTIONS

(Conference Registration fees payable to SCS in US dollars only)

Member #: \_\_\_\_\_

**Comprehensive Registration:** (includes Sunday tutorial)  
Early (30 days or more before conference): Late (within 30 days of the conference):

SCS Members	\$600.00	\$640.00
Non-Members	\$700.00	\$740.00
Student (Author**)	\$400.00	\$485.00

**Full Conference Registration:** Early (30 days or more before conference): Late (within 30 days of the conference):

SCS Members	\$450.00	\$550.00
Non-Members	\$550.00	\$650.00
One-Day (Non-Authors)	\$195.00	\$225.00
Group of four or more, per person (one Proceedings per group)	\$290.00	\$320.00
Student Member (Author**)	\$250.00	\$335.00
Student Non-Member (Author**)	\$350.00	\$435.00
Student (Attendance Only**)	\$ 55.00	\$ 55.00

### Miscellaneous:

Tutorial (1/2 Day) Indicate Tutorial # _____	\$150.00	\$200.00
Additional Proceedings	\$ 35.00	\$ 45.00
Social Event (as available)	\$ 35.00	\$ 45.00

**TOTAL** \$ \_\_\_\_\_ \$ \_\_\_\_\_

Method of Payment: (No cash accepted)

\_\_\_\_ VISA \_\_\_\_ Mastercard \_\_\_\_ American Express \_\_\_\_ Check\* \_\_\_\_ Company Purchase Order \_\_\_\_ Gov't DD Form 1556

Card Number: \_\_\_\_\_ Exp. Date: \_\_\_\_\_

Authorizing Signature: \_\_\_\_\_

\* 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

**Return To: SCS, 4838 Ronson Court, Suite L, San Diego, CA 92111, USA or Fax to 858-277-3930**  
**Please contact us at 858-277-3888 E-mail: [info@scs.org](mailto:info@scs.org) Internet: <http://www.scs.org>**