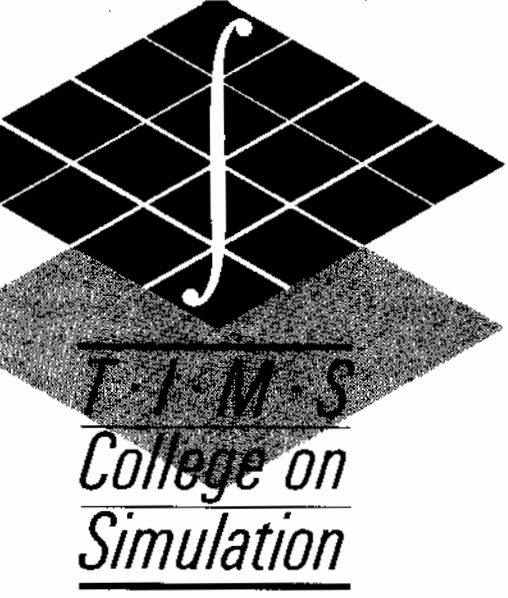

BARRY L. NELSON

Volume 15
Number 1
Spring 1991

THE INSTITUTE OF MANAGEMENT SCIENCES

NEWSLETTER

President's Message

As is now our custom, the College's two major awards for 1990 were presented at the Opening Session for the 1990 Winter Simulation Conference this past December, in New Orleans. I'd like to take this opportunity to extend my personal congratulations to George Fishman for his long-time and extensive work leading to his selection for the Distinguished Service Award. George's name was one of the first I became familiar with as I started to learn about simulation, and among his many important contributions was being the founding Simulation Departmental Editor for *Management Science*. The College's thanks go to the selection committee, chaired by Bob Sargent, with Tom Schriber and Lee Schruben being the other members.

Congratulations for the Outstanding Publication Award go to Xi-Ren Cao, Phil Heidelberger, Rajan Suri, and Michael Zazanis for their important analysis of the properties of infinitesimal perturbation analysis. Our appreciation goes to the selection committee for this award, chaired by Doug Miller with the other members being Steve Roberts and Peter Welch.

Speaking of the WSC, the 1990 edition in New Orleans was by any measure a big success. The whole simulation community is indebted to General Chair Randy Sadowski and the rest of the WSC'90 committee for their tireless efforts in putting on a great event. The College is proud to be counted among its sponsors.

As a result of our business meeting in New Orleans, we have several hard-working committees up and running. Jorge Haddock is chairing a committee consisting of Dean Hartley and Jeff Tew to look into specifics of the College's publishing a monograph series; they have made significant progress and a report will be presented in May at the Nashville TIMS/ORSA conference. Another committee composed of George Fishman, Bob Sargent, and Jim Wilson is looking into making recommendations for Jim's replacement as Simulation Departmental Editor for *Management Science*. Andy Seila is chairing a committee with Jorge Haddock and Thanos Avramidis to investigate expansion of our financial aid to Ph.D. students in support of the College-sponsored student-paper session at the WSC. The Distinguished Service Award committee is currently being chaired by Tom Schriber, with Bob Sargent in his final year and George Fishman coming on to replace Lee Schruben. The Outstanding Publication Award committee is now chaired by Doug Miller, with Peter Welch in his final year and Jim Wilson joining to replace Steve Roberts.

We welcome Jeff Tew as the new Assistant Editor of the *Newsletter* with this issue.

—David Kelton, President
TIMS College on Simulation

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Advertisements

Editor's Corner

In addition to providing College news prior to the TIMS/ORSA meetings, we aim to serve the wider simulation community. Thus the College has been distributing the *Newsletter* to attendees of various conferences, supported both by the College and by our advertisers. Two new items in this issue include a brief look at some new simulation books and a report of a new simulation association for China.

At the request of College Members, the e-mail list was distributed electronically to all members on the list, and we plan to provide the updated e-mail list following the Nashville conference. This distribution provided us with corrections to a number of addresses and several requests to be added to the list. We will be seeking to expand the coverage of simulation professionals on the list. Most of the material for this issue of the *Newsletter* was submitted electronically. Jeff Tew is investigating other ways that we can distribute information electronically between simulators. Incidently, the March 1991 issue of the *Amstat News* included an article, "Using E-Mail Addresses: What Does All That Dot Business Really Mean," describing electronic mail addresses on several of the nets in use. Those new to e-mail will find it especially helpful.

Members (and nonmembers) of the College are reminded that the Business Meeting will be held Tuesday night of the TIMS/ORSA conference, from 6:15 to 7:15 in the Cumberland A room. Refreshments will be served, and all are invited.

Jeff Tew is the new Assistant Editor for the *Newsletter* and will be taking over the reins of the *Newsletter* next year. Please send your abstracts, meeting announcements, and other contributions to either of us. The editorial deadline for the Fall *Newsletter* will be Sept. 8, 1991. *—jjs and jdt*

TIMS College on Simulation Newsletter is published twice each year, in the Spring and Fall, by TIMS College on Simulaton. Membership in the College on Simulaton is independent of membership in The Institute of Management Sciences. Annual dues for non-TIMS members is $3; TIMS members may join for $2. Dues for those outside of the U.S./Canada is $3.

To join, send name, address, e-mail address (if applicable), and the appropriate dues to: David Goldsman , School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0205. Make checks payable to TIMS College on Simulation. Please pass along this announcement to others who might be interested in joining.

Bulk rate postage paid at Atlanta, GA and additional mailing offices. POSTMASTER: Send address changes to ***TIMS College on Simulation Newsletter***, 290 Westminster Street, Providence, RI 02903.

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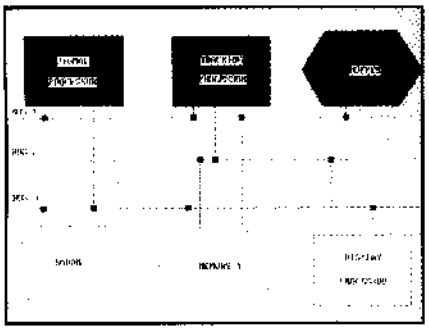

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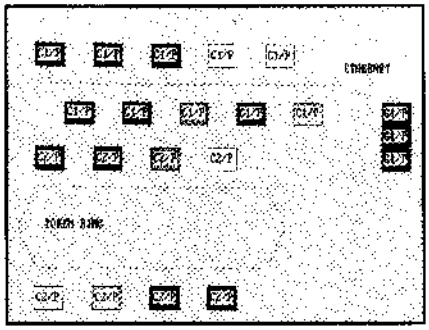

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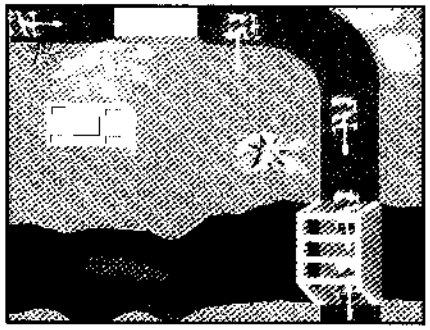

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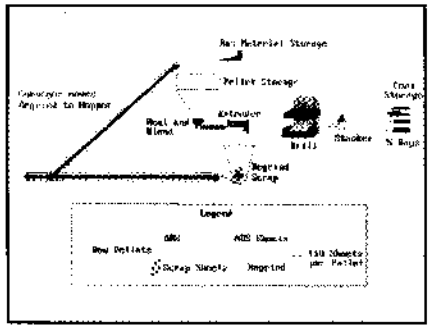

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IMS

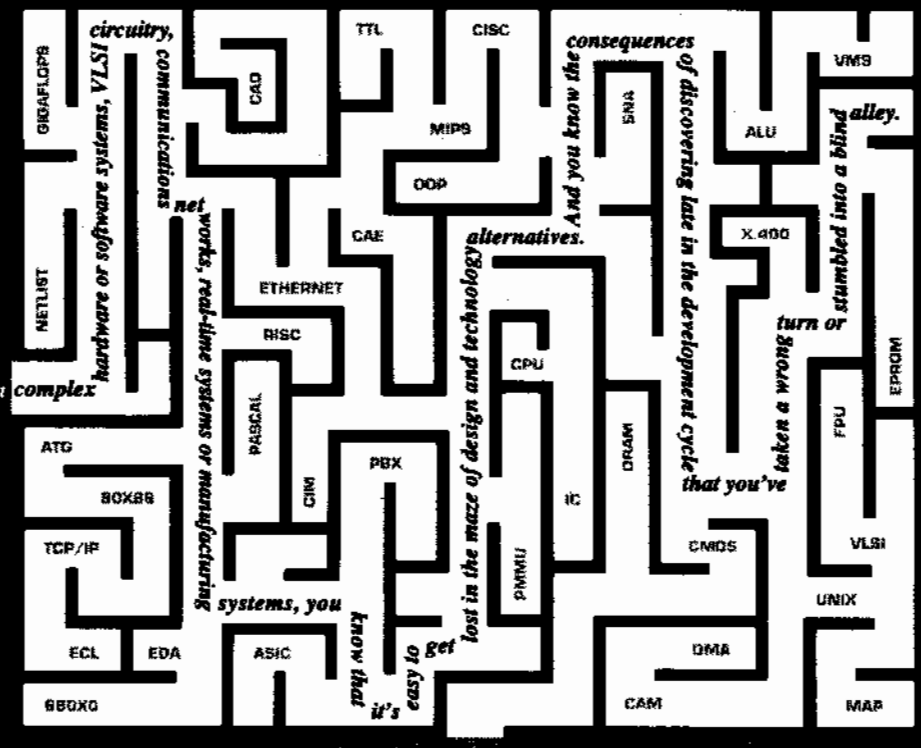
Minutes of College Meeting at TIMS/ORSA Philadelphia

Members attending: Michael Fu, Paul Glasserman, Bob Sargent, Keebom Kang, Dean Hartley, Bruce Schmeiser, Gary Kochman, Ingolf Stahl, Dave Frye, Christos Alexopoulos, Sherif Hashem, Dave Goldsman
Nonmembers attending: Yorai Wardi, Joseph Kreimer
1. Barry Nelson called the meeting to order at 5:35 p.m. on October 30, 1990.
2. The attendees introduced themselves.
3. The Treasurer's report and Minutes of the Las Vegas business meeting were read and approved.
4. Barry Nelson discussed the WSC Doctoral Colloquium.
5. We discussed the TIMS/CS Publication Award; the award committee consists of Jim Wilson, Peter Welch, and Doug Miller.
6. The Monograph Series Committee was formed. It consists of Dean Hartley, Jorge Haddock, and Jeff Tew. Their first report will be given at the 1990 WSC.
7. Barry Nelson informed us that TIMS/CS will sponsor 7 sessions at ORSA/TIMS Nashville. Two of these sessions will be jointly sponsored with the Military Section of ORSA. Barry encouraged people to organize sessions.
8. New Business — Barry Nelson attended the TIMS officers' breakfast. At the breakfast, officers discussed enhanced cooperation between ORSA and TIMS. Should journals be changed? How can we get more practitioners in conferences and activities?
9. The meeting was adjourned at 6:00 p.m.

Minutes of College Meeting at WSC New Orleans

Members attending: Barry Nelson, Jim Swain, Yun Bae Kim, Christos Alexopoulos, Diane Bischak, John Charnes, Doug Miller, Lee Schruben, Dean Hartley, Russell Barton, Enver Yucesan, Doug Morrice, Michael Ketcham, Dave Withers, Gordon Clark, Chuck Reilly, Jim Wilson, Jorge Haddock, Paul Lalinsky, Alan Pritsker, Bruce Schmeiser, Lynne Goldsman, Bridget Moore, Tom Schriber, Ben Fox, Andy Seila, Pandu Tadikamalla, Perwez Shahabuddin, Thanos Avramidis, Sherif Hashem, Susumu Morito, Pierre L'Ecuyer, Arne Thesen, Steve Roberts, Paul Sanchez, Rajan Suri, Sheldon Jacobson, Dave Goldsman, Mike Taaffe, Bob Sargent
Nonmembers attending: Luc Devroye, Edward Collins, B.J. Schroer, Peter Welch, Stephen Mathewson, Sigrun Andradottir
1. Dave Kelton called the meeting to order at 5:30 p.m. on December 11, 1990.
2. The Treasurer's report and Minutes of the Philadelphia business meeting were read and approved.
3. Barry Nelson discussed the ORSA/TIMS sessions. (See the Philadelphia Minutes.) He encouraged people to submit jointly sponsored sessions. Specifically, he mentioned the 1992 TIMS Joint International Meeting in Helsinki.
4. Jim Swain reported on the Fall 1990 *Newsletter*. He asked people to send abstracts and information about their schools' simulation programs. Responding to a suggestion made by Mike Taaffe, Jim said that he will send the *Newsletter* e-mail list to anybody who so asks. Jim also announced that Jeff Tew is the *Newsletter*'s Associate Editor.
5. Steve Roberts, the TIMS/CS liaison to the WSC Board, stated that 1990 WSC attendance was about 550. The 1991 Program Chair will be Gordon Clark; the 1992 Program Chair will be Jim Wilson; and the 1993 Program Chair will be Bill Biles.
6. Peter Welch reported on the 1990 Outstanding Simulation Publication Award. It had been presented Monday morning at the opening session of the WSC to Xi-Ren Cao, Phil Heidelberger, Rajan Suri, and Michael Zazanis for their paper, "Convergence Properties of Infinitesimal Perturbation Analysis Estimates." Peter then solicited nominations for next year's award.
7. Bob Sargent reported that the Distinguished Service Award was presented to George Fishman for long-standing, exceptional service to the simulation community. Bob then solicited nominations for next year's award. Next year's award committee consists of Bob Sargent, Tom Schriber, and George Fishman.
8. Steve Roberts motioned that the Chairs of the award committees be the committees' third-year members (instead of the second-year members). The motion failed.
9. The new TIMS/CS members were introduced.
10. Jim Wilson gave the *Management Science* Area Editor's report. He noted that G. Bitran will become the new Editor-in-Chief on 1/1/91. Jim solicited state-of-the-art papers for possible publication in *Management Science*.
11. The Monograph Series Committee, which consists of Jorge Haddock (Chair), Dean Hartley, and Jeff Tew, reported on their preliminary findings. Additional discussion will take place at Nashville ORSA/TIMS.
12. New Business—We passed a motion to use our new TIMS/CS logo in subsequent WSC Calls for papers (instead of the old TIMS logo).
13. We tabled a motion by Jorge Haddock to award two grants of $400 for Ph.D. students to attend the WSC Doctoral Colloquium. David Kelton appointed a committee to investigate Jorge's proposal. The committee consists of Andy Seila (Chair), Jorge Haddock, and Thanos Avramidis.
14. The meeting was adjourned at 6:44 p.m.

Respectfully submitted,
David Goldsman, Secretary-Treasurer
April 1, 1991



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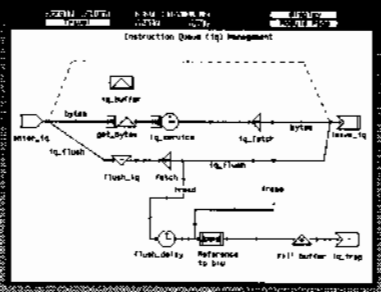

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Treasurer's Report

For the period 9/15/90 through 3/15/91, the College had the following transactions at the First National Bank of Atlanta, Atlanta, GA:

Balance forward: (First National Bank of Atlanta, Atlanta, GA — Checking - $5,451.41; CD - $24,299.00)			$29,750.41
Revenues:			
Interest from checking account	128.94		
Interest from CD	647.42		
Dues	17.00		
Total revenues:		793.36	
Disbursements:			
Checking account charges	30.00		
Award plaques	219.50		
Publication Award	500.00		
Photography costs	153.00		
Student presentation reimbursements	200.00		
Distinguished Service Award expenses	1,083.16		
Newsletter expenses	1,201.51		
WSC TIMS/CS meeting expenses	494.52		
WSC, TIMS/CS logos	20.00		
Total disbursements:		3,901.69	
Net (revenues - disbursements):		-3,108.33	
Balance forward (previous balance + net):			$26,642.08

In addition to the above funds, the College has on account at TIMS Headquarters the sum of $1170.00 (as of 12/31/90), bringing the College's net worth to $27,812.08.

Respectfully submitted,
David Goldsman, Secretary-Treasurer
April 1, 1991

Report on Chinese Simulation Society

The National Computer Simulation Association of China (NCSAC) has recently been established. The primary purpose of NCSAC is to provide a Chinese forum for regional and national simulation societies to promote the advancement of systems simulation in industry, research and education. The NCSAC was formally set up at the Third Computer Simulation Congress of China held in Changsha, Hunan province on October 22, 1990.

Development of computer simulation technology in China began in the 1970s. The first computer simulation congress of China was held in Hangzhou, Zhejiang province in 1983. At the second congress, held in Yantai, Chandong province in 1986, a national association was actively discussed and an informal association was founded at that time.

The application of computer simulation has covered the whole range of human activities and natural phenomena in China. The members of NCSAC come from such diverse fields as the military, transport, mining, manufacturing systems and economic systems. The members include professors, engineers, and designers. There is a nonperiodic newsletter of NCSAC to facilitate communication between members of the NCSAC.

An international computer simulation conference in China in 1992 has been considered by the NCSAC. For further information contact Prof. Binghui Hou, School of Economics and Management, Tsinghua University, Beijing, 100084, P.R.C.

Editor's note: Information about the NCSAC was provided by Professor Linqi Jiang of the Department of Management Engineering, Fuxin Mining Institute. Professor Jiang is also the Newsletter Editor for the NCSAC.

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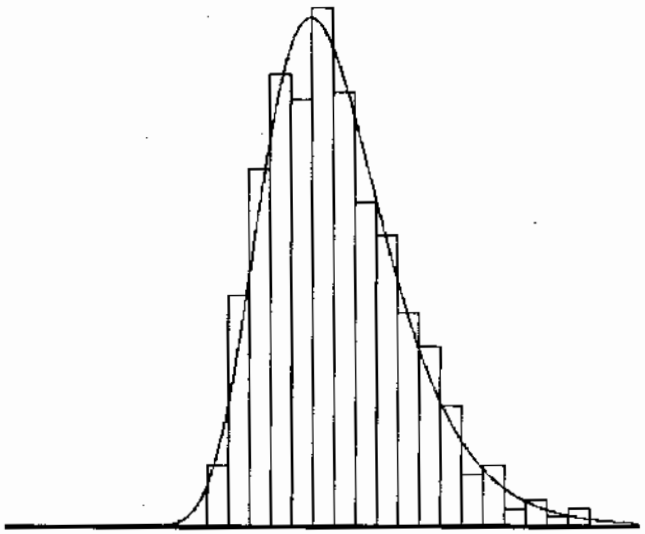

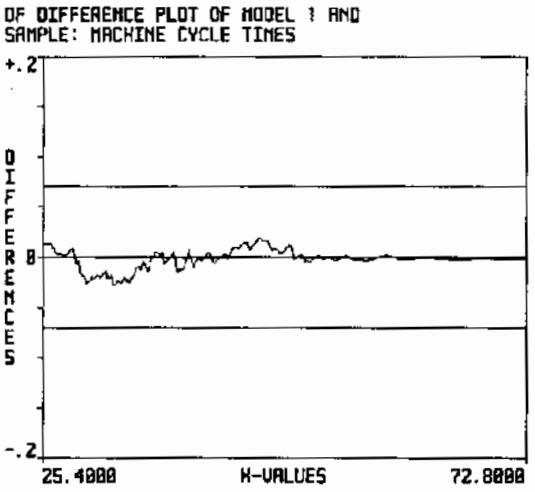

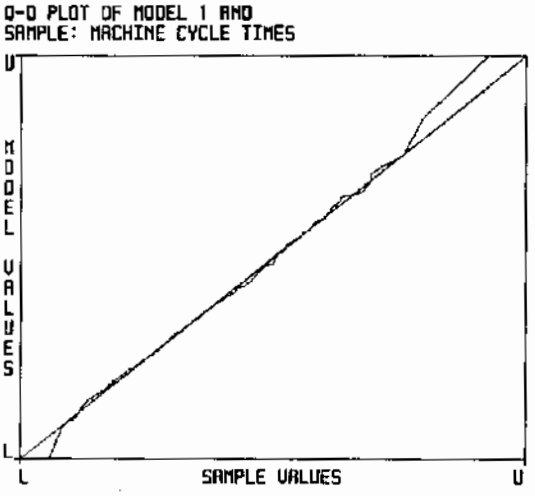

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Outstanding Simulation Publication Award for 1991

To recognize outstanding contributions to the simulation literature, the College on Simulation annually sponsors an **Outstanding Simulation Publication Award.** The 1991 Award will be presented by Professor Doug Miller, the outgoing Chairperson of the Awards Committee, at the Opening Session of the 1991 Winter Simulation Conference.

Nominations for the 1991 Outstanding Simulation Publication Award should be sent by **April 30, 1991,** to the incoming Chairperson of the Awards Committee:

Professor Doug Miller
Department of Operations Research & Applied Statistics
School of Information Technology and Engineering
George Mason University
Fairfax, VA 22030
(703) 764-4688, Fax (703) 323-2680

The complete set of rules governing the Outstanding Simulation Publication Award appeared in Vol. 9, No. 2 of this *Newsletter* (Fall 1985). In summary, anyone is eligible to win the Award. Journal articles, proceedings articles, books, and monographs copyrighted in 1987, 1988, and 1989 are eligible for the Award to be presented in 1991. Technical reports, research memoranda, working papers, theses, and dissertations are not eligible.

Nominations may be made by anyone, including the author(s), but they may not be made anonymously. Nominations should include: (a) a copy of the written work including all bibliographical information (in the case of books, the Awards Committee will obtain copies); (b) a short statement suitable for reading at the award ceremony if the work is chosen; and (c) any other information thought relevant by the nominator.

TIMS/CS Newsletter Advertising Information

TIMS/CS Newsletter, a publication of TIMS College on Simulation, is produced by and for those involved in the academic and industrial use of simulation products worldwide. The *Newsletter* is distributed to the more than 270 members of the College, at the Summer and Winter Simulation Conferences (500-650 attendees each), and at the Spring and Fall TIMS/ORSA Joint National Meetings (between 1,800 and 2,500 attendees each).

This publication offers an excellent opportunity to advertise products and services, or for recruitment purposes, to this well-informed group at significantly lower prices than other publications dealing with this subject. Rates, deadlines and dimensions follow. If you have other questions, please contact:

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Issue	Copy/Order Due	Publ. Date	Print Run
Fall 1991	September 20	October 1	1,100
Spring 1992	April 1	April 16	1,100
Fall 1992	September 20	October 1	1,100

Display Advertising Rates

Size	Full	Half	Third	Quarter	Eighth
One-time	$200	$140	$120	$80	$55
Two-time	$180	$126	$108	$72	$50

(Rates are subject to change)

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SimTec '91

Simulation Technology Conference International 1991

October 21-23, 1991 / Orlando Twin Towers / Orlando, Florida

SimTec '91 will be the first in a series of Fall technical conferences organized by Regional Councils of The Society for Computer Simulation. The conference is expected to attract internationally-known experts in simulation who wish to exchange their latest research results, ideas, and refereed papers with other simulationists in an atmosphere conductive to the advancement of simulation and its applications. In addition, a simulation standards committee meeting will be held at the conference and attendees will be invited to attend a tour of Martin Maretta.

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Best SimTec '91 Paper Awards

Selected papers will be considered for publication in the SCS monthly journal, *SIMULATION*. Paper contest categories are: Academic, Industrial, and Government. In addition: SESC '91 Student Paper Competition Award $500.

Deadlines and Dates

One page abstracts, session, tutorial, discussion, and working group proposals are due by **June 15, 1991**. Include a cover letter stating the name, address and phone number of each author. Specify category: academic, industrial, or government. Final papers or briefing slides **MUST** be received and reviewed by **August 1, 1991**.

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**** SPECIAL NOTE FOR STUDENTS ****

Papers submitted by students, accompanied by a cover letter from their supervising professor, will be considered for the SESC '91 Student Paper Competition Award: $500

Abstracts of Papers

"RISC Approach in Developing Tools for Simulating Discrete Production Systems," Ilario Astinov, Department of Mechanical Engineering Technology, Sofia University of Technology, Sofia, Bulgaria

A simple, yet robust modeling system is developed for use in Bulgaria, where access to simulation tools is limited and training in simulation languages is virtually unknown. The system is based on a survey of the best-known discrete-event simulation languages GPSS, SIMULA, SLAM II, SIMAN/CINEMA, SEE-WHY, WITNESS and the requirements of production systems analysis. A number of production systems of increasing complexity were analyzed to determine the essential features required for modeling. In the spirit of RISC (reduced instruction set computer), a network model based on five block types was developed: the five blocks include generator and pit to create and remove workpieces from the model, operation blocks to model activities, buffer to represent workpiece buffers, and connector to represent interaction logic.

The model is implemented in strict ANSI 3.9/78 FORTRAN 77 general purpose programming language. A simulation library contains:

- DISLIB — DISplay LIBrary, containing subroutines for creating user interface;
- RNDLIB — RaNDom number generating LIBrary, containing functions for generating random numbers and variates; and
- MDLLIB — MoDeLling LIBrary, containing subroutines and a main program, which perform the functions of the blocks. The model has been extensively validated and applied to problems involving the machine tool industry.

"Weighted Batch Means for Confidence Intervals in Steady-State Processes," Diane P. Bischak, W. David Kelton, and Stephen M. Pollock, North Carolina State University, University of Minnesota, and University of Michigan

We propose a new procedure for estimating the variance of the sample mean of a covariance-stationary process. The procedure, a modification of the method of batch means, is an improvement over existing methods when the process displays strong positive correlation and a comparatively small number of observations is available. We assign weights to observations within a batch that minimize the variance of the weighted point estimator of the mean while providing unbiased point and variance estimators. Analytic solutions are given for AR(p) and MA(1) processes.

In experiments with positively-correlated processes, half-lengths of resulting confidence intervals are larger than for unweighted batch means, and the confidence level of the constructed interval is consistently closer to nominal levels than for the unweighted method. The method is most effective on processes with strong correlation over many lags, as is typical in queue-delay processes; its superior coverage for the difficult circumstances of little data and high correlation makes it a useful addition to existing methods.

"Sample Path Derivatives for (s,S) Inventory Systems," Michael C. Fu, University of Maryland, College Park

For (s,S) inventory systems, we derive sample path derivatives of performance measures with respect to the two parameters s and S. These derivatives yield derivative estimators which can be estimated from a single sample path or simulation of the inventory system, in some cases not even requiring actual knowledge of the underlying demand distribution.

Such derivative estimates would be useful in sensitivity analysis or in gradient-based optimization techniques. We consider both the finite and infinite horizon non-discounted periodic review system with general independent and identically distributed continuous demands, random lead times, full backlogging, and general holding and shortage costs.

For the infinite horizon model, consistency proofs are given for some special cases, although we argue as to why the estimators should be correct for the more general case. Some simulation experiments utilizing the derivative estimators in a gradient-based algorithm are reported.

"Second Derivative Sample Path Estimators for the GI/G/m Queue," Michael C. Fu and Jian-Qiang Hu, University of Maryland, College Park, and Boston University

We derive sample path estimators for second derivatives of performance measures of GI/G/m queues using the technique of perturbation analysis. The derivations of the estimators shed some new light on the choice of conditioning quantities for generating infinitesimal perturbations and on the appropriateness of propagating the generated perturbations. The full form of the estimators includes both positive and negative conditional contributions, suggesting the general non-convexity properties of system time observed by previous authors.

For the special case of exponential interarrival times and service times, a proof of unbiasedness is provided for the two-server case. For the special case of deterministic arrivals, the estimator simplifies and convexity results are indicated by the resulting form of the estimator. For the most general case, insertion of additional simulation time is necessary, and simulation results are provided for a few examples, which indicate consistency of the estimators.

An approximation is also introduced which eliminates the often impractical insertion, and simulation results indicate good accuracy.

"A Taxonomy of Perturbation Analysis Techniques," by Y. C. Ho and S. Strickland, Harvard University and University of Virginia

This short paper establishes a taxonomy of the various PA techniques that have been advanced so far. We classify all the different variations of PA according to a few simple and basic ideas concerning the model of the DEDS and probabilistic equivalence.

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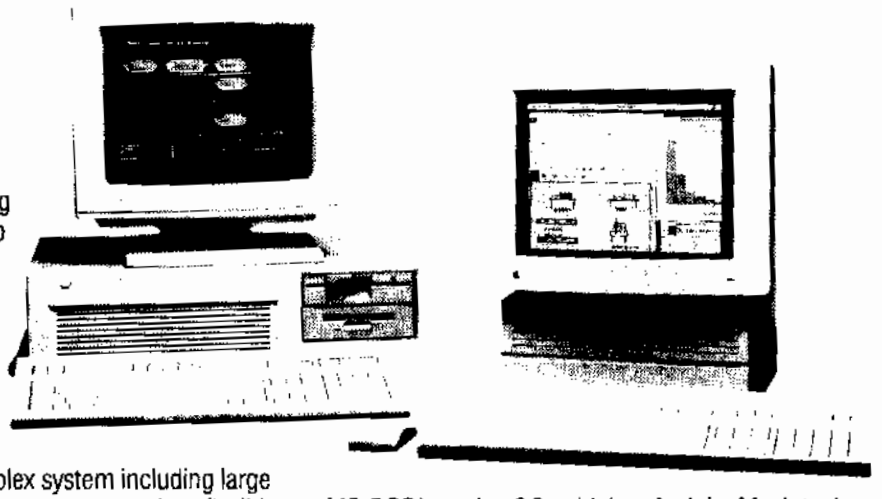

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Awards

Fishman wins Distinguished Service Award

The TIMS College on Simulation presented its Distinguished Service Award to George S. Fishman at the 1990 Winter Simulation Conference, held in New Orleans, LA, in December 1990.

The Distinguished Service Award is given annually, at most, to an individual who has performed long-standing, exceptional service to the simulation community.

Dr. Fishman, who is a Professor of Operations Research at the University of North Carolina, has given exceptional service to the simulation community for over 20 years. This includes, along with many other service activities, being Chairman of the TIMS College on Simulation and Gaming from 1972-74; serving as the first Department Editor for Simulation for ***Management Science*** from 1978-87; serving on the Board of Directors of the Winter Simulation Conference from 1978-80; organizing and editing a special issue of ***Management Science*** (November 1989) on simulation; and currently serving on the editorial board of the new ACM journal, ***Transactions on Modeling and Computer Simulation***. Dr. Fishman is also known for his research in simulation and for the books he has written.

George Fishman (left) receives Distinguished Service Award from Robert Sargent (right).

Four share publication honors

The 1990 Outstanding Simulation Publication Award of the College on Simulation was presented to Xi-Ren Cao of Digital Equipment Corp., Philip Heidelberger of IBM, Rajan Suri of the University of Wisconsin, and Michael Zazanis of Northwestern University for their paper, "Convergence Properties of Infinitesimal Perturbation Analysis Estimates," which appeared in ***Management Science***, November 1988.

The presentation was made at the opening session of the 1990 Winter Simulation Conference, held in New Orleans, LA, last December. Heidelberger and Suri were present to receive their plaques from Peter Welch, chairman of the Awards Committee. The other members of the committee were Douglas Miller and Stephen Roberts.

In presenting the award, Welch described the paper as being "exceptionally well written," one which "clarified and placed in perspective both the theory and practice of infinitesimal perturbation analysis."

Rajan Suri (left) and Philip Heidelberger (center) receive the 1990 Outstanding Simulation Publication Award from Peter Welch (right).

Nominations solicited for TIMS/CS Service Award

Each year, the TIMS College of Simulation may give to one individual an award on behalf of the simulation community. Such service should extend over a multiyear period (from ten to twenty years is not unusual), and the concept of service for purposes of this award does NOT include research and/or teaching contributions, but instead encompasses such things as editorial-board services and services in organizing and presenting conferences.

Those interested in making nominations for this service award should send a letter of nomination to the chair of the selection committee (see below). Such nominations should be in the hands of the chair by Sept. 1 1991, with the award (if any) then to be made at the 1991 Winter Simulation Conference in December, 1991.

Anyone is eligible to make nominations. Letters of nomination should spell out in detail the reasons why the nominee is being nominated for the award. If possible, the nominee's vita should be included with the nomination letter.

Nominations and supporting material should be sent to the 1991 chair of the selection committee:

Prof. Thomas J. Schriber
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University of Michigan
Ann Arbor MI 48109-1234
(313) 764-1398
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Status report on the Simulation Department of *Management Science*

For the calendar year 1990, a total of 14 new papers were submitted to the Department; and editorial work was completed on 15 papers, with 3 papers accepted, 11 papers rejected, and 1 paper withdrawn. During the first quarter of 1991, 5 new papers have been submitted; and editorial work has been completed on 8 papers with 6 papers accepted, 1 paper rejected, and 1 paper withdrawn. Currently 19 papers are in process.

We are pleased to announce that Russell Cheng of the University of Wales has agreed to serve as an Associate Editor of the Simulation Department. The other Associate Editors are Peter Glynn of Stanford University, Dave Goldsman of Georgia Tech, Pierre L'Ecuyer of Université de Montréal, and Steve Roberts of North Carolina State University.

At the request of Professor Gabriel Bitran, the new Editor-in-Chief of *Management Science*, the term of office for Jim Wilson, the current Simulation Department Editor, has been extended to the end of 1992.

1991 Winter Simulation Conference

December 8-11, 1991
Phoenix, AZ

Topics in all aspects of discrete event and combined (discrete/continuous) simulation will be covered in sessions following several formats: contributed and invited papers, tutorials, reviews and panel discussions. A special feature is the focus sessions, centering on highly topical problems and issues.

Contributions are solicited in these categories:

- Papers treating applications and methodology. Application papers should emphasize positive and negative lessons to be learned in modeling, analysis, and implementation.
- Both broad and in-depth reviews designed for practitioners and researchers.
- Proposals to organize panel discussions or regular paper sessions, present state-of-the-art reviews, present tutorials, or serve as a discussant.
- Demonstrations of hardware and software.
- Papers and presentations in simulation education.

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Ohio State University
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Please include your full address, affiliation, telephone number and, if available, an electronic mail address with all correspondence.

How to join TIMS College on Simulation

You can join the College on Simulation even if you aren't a member of The Institute of Management Sciences. The cost of annual dues for non-TIMS members of the College is only $3; TIMS members pay only $2. To join, please fill out this form and send it, along with a check for the appropriate amount, to: **David Goldsman, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0205.** Make your check payable to "TIMS College on Simulation."

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NOTE: If you know people who might be interested in joining, please pass along this announcement.

Area Report for *Operations Research*

The simulation area of the journal publishes articles on the application of simulation, surveys of simulation topics, new simulation methodology, and new simulation theory. From January, 1987, through March, 1991, 56 manuscripts have been submitted; nine have been accepted for publication. Since some of these manuscripts are still in process, the acceptance rate is probably closer to 20 or 25 percent. The large majority of the accepted papers extend theory and/or methodology, often with extensive literature review.

Manuscripts can be submitted directly to me at: Bruce W. Schmeiser, School of Industrial Engineering, Purdue University, 1287 Grissom Hall, West Lafayette, IN 47907-1287. I can be contacted at e-mail: schmeisc@ecn.purdue.edu; FAX: (317) 494-1299; work: (317) 494-5422; home: (317) 743-2533. Manuscript abstracts and introductions must be readable to most readers of the journal.

ACM Transactions on Modeling and Computer Simulation

The *ACM Transactions on Modeling and Computer Simulation (TOMACS)* provides a single archival source for the publication of high-quality research and developmental results in modeling and computer simulation. The first issue was published in January 1991. Included within the scope of *TOMACS* is work in all three simulation subareas. While discrete event simulation is the subject of emphasis, papers in continuous and Monte Carlo simulation will also receive serious consideration.

Models and modeling are inherent to problem solving in many subareas of computer science and computing technology. Moreover, the use of simulation techniques is pervasive, extending to virtually all the sciences. *TOMACS* serves to enhance understanding, improve practice, and increase utilization of modeling and computer simulation. Submissions should contribute to realization of these objectives, and papers treating applications should stress their contributions vis-a-vis these objectives.

The vertical scope of *TOMACS* includes: research papers, the principal focus; research notes, abbreviated or narrower treatments; refereed correspondence, addressing technical issues stemming from papers or notes; expository articles, including tutorials and case studies; book reviews and standards notification and discussion.

The horizontal scope includes, but is not limited to: representation of stochastic behavior, analysis of output, modeling concepts and methodology, model diagnosis, graphical and iconic modeling, simulation languages, simulation support environments, model management, parallel and distributed simulation, visual interactive simulation, model verification and validation, qualitative modeling and simulation, combined and hybrid simulation models, metamodels, virtual reality, artificial intelligence in simulation, decision support systems, system dynamics, and computer gaming. These topics are categorized in a "loose" partitioning among area editors.

Address questions and articles for submission to: Richard E. Nance, Editor-in-Chief, Systems Research Center, 320 Femoyer Hall, Virginia Tech, Blacksburg, VA 24061-0251, (703) 231-6144, nance@vtopus.cs.vt.edu.

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Books

An Introduction to Simulation Using GPSS/H, by Thomas J. Schriber. John Wiley and Sons Inc., 1990, 435 pp., 8-1/2 by 11 hardbound, $44.95, ISBN 0-471-04334-6.

A feature of this 17-chapter book is that it comes with Student DOS GPSS/H on an included disk, so the reader is free to do GPSS/H-based modeling wherever he or she has access to a DOS machine. (Student GPSS/H is a full feature implementation of commercial GPSS/H, except that models are limited in size to 100 blocks or 255 statements.) Additional aspects of the book include:

- The opening chapter provides perspectives on discrete-event simulation in general, including a review of application articles.
- Interactive monitoring of GPSS/H simulations is given extensive treatment early in the book, with 56 screen shots included.
- The data structures and algorithms that GPSS/H uses to conduct a simulation are explained to support detailed use of the GPSS/H interactive monitoring capability.
- Ten case studies involving batch-mode use of GPSS/H are presented, and the corresponding models are provided on the included disk.
- There are three chapters on fundamental design of experiment and analysis of output; control of the GPSS/H random-number generators is explained and illustrated, the use of antithetic random variates and common random numbers in GPSS/H is discussed and illustrated, and a case is included showing use of the Dudewicz and Dalal methodology for selecting the probable best from two or more competing alternatives
- The last chapter provides an overview of those elements of GPSS/H not given detailed treatment in the book.
- There are over 350 exercises, with solutions to about half of them given in an appendix and with solution models additionally provided on the included disk.

The author provides teaching-support materials for the book to adopters who request them. These include the syllabus for the author's 14-week course based on the book, and statements of the 13 modeling assignments and a final-exam assignment given in that course.

Also included are over 500 paper masters for transparencies that can be used to give detailed lectures on the book. Paper masters for another 260 transparencies (including 33 GPSS/H models) are provided as the basis for lectures on aspects of GPSS/H not given detailed treatment in the book.

Simulation and Statistics: an Introduction, by Jack P.C. Kleijnen and Willem J.H. van Groenendaal (publication information not supplied).

This book provides a basic introduction to simulation. It gives a survey of problems that can be analyzed by means of simulation, especially problems in economics, business administration, management science, operations research, and mathematical statistics. It also shows how to analyze simulation results. This analysis makes it possible to obtain more general conclusions, when using simulation. Moreover, the efficient design of simulation experiments is discussed. For all these topics there is specialized literature, but it is often too difficult for the novice. After reading this book, however, the specialized literature becomes accessible. Thus the book outlines the problems and pitfalls of practical applications of simulation technqiues. Understanding the examples requires a basic knowledge of business administration and operations research. Understanding the techniques presented requires knowledge of elementary computer science, mathematics and statistics.

- The theory and application of computer-generated, pseudo-random numbers in computer simulations and the generation of random variates, such as the normal and Poisson, from uniform deviates.
- Applications are drawn from economics, business and operations research, including inventory and queuing systems. Forrester's Industrial and Systems Dynamics are also included.
- Programs for queuing simulations and specialized simulation languages.
- Simulation in mathematical statistics, such as robustness studies of linear regression.
- Regression "meta-models" and ANOVA analysis of output, together with statistical designs, such as the ^{k}factorial, which can be used to estimate the regression meta-model or to conduct the ANOVA.
- Run length determination and a selection of variance reduction methods, including common- and antithetic random numbers.
- Verification and validation of simulation models. Literature sources professional societies in the simulation area.

A floppy disk with a collection of examples and exercises in Pascal is also available. These examples are used for demonstration purposes during the lectures. The exercises are to be solved using a computer and closely follow the chapters of the book. After doing the exercises, the reader should be ready to start simulation projects in practice.

Simulation Sessions at Nashville TIMS/ ORSA Meeting

The following sessions will be sponsored by the TIMS College on Simulation for the Spring 1991 TIMS/ORSA Conference in Nashville:

Session	Title
	Monday
MA 35	Simulation Modeling*
MB 35	Manufacturing Simulation*
MC 48	Multivariate Analysis in Simulation*
	Tuesday
TD 48	Simulation with a Military Flavor*
TE 48	Simulation Input Modeling*
	Wednesday
WA 7	Simulation I
WB 7	Simulation II
WC 7	Statistical Issues in Simulation
WC 28	Optimization and Gradient Estimation using Simulation*
WD 7	Simulation Applications
WD 28	Simulation of Manufacturing Systems*

NOTE: * indicates a session sponsored by the College.

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micro-GPSS is described in I. Stahl, *Introduction to Simulation with GPSS: on the PC, Macintosh and Vax*, Prentice Hall International, 1990. Order from your local bookstore.

Event Calendar

TIMS/ORSA Joint National Meeting, May 12-15, Opryland Hotel, Nashville, TN. Contact Michael Beasley, Dover Elevator Corp., P.O. Box 6400, Horn Lake, MS 38637, (601) 393-2110, ext. 630.

European Simulation Multiconference, June 16-19, Copenhagen, Denmark. Contact Philippe Geril, European Simulation Office, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium, tel.: 0032.91.236961, ext. 653.

Summer Computer Simulation Conference, July 22-24, Hyatt Regency Hotel (Inner Harbor), Baltimore, MD. Contact The Society for Computer Simulation, P.O. Box 17900, San Diego, CA 92117, (619) 277-3930.

Simulation Technology Conference International, October 21-23, Orlando Twin Towers, Orlando, FL. Contact Mary Lou Padgett, 1165 Owens Road, Auburn, AL 36830, (205) 821-2472.

TIMS/ORSA Joint National Meeting, November 3-6, Hilton Hotel, Anaheim, CA. Contact Carlton Scott, Graduate School of Management, University of California, Irvine, CA 92717, (714) 856-5336.

1991 Winter Simulation Conference, December 8-11, Phoenix, AZ. Contact Gordon Clark, Dept. of Industrial and Systems Engineering, Ohio State University, 1971 Neil Avenue, Columbus, OH 43210, (614) 292-7863.

1992

TIMS/ORSA Joint National Meeting, April 26-29, Marriott World Center, Orlando, FL. Contact Bill Swart, Industrial Engineering Dept., University of Central Florida, Orlando, FL 32816.

TIMS/ORSA Joint National Meeting, November 1-4, Hilton Hotel, San Francisco, CA. Contact Chaiho Kim, The Leavey School of Business, University of Santa Clara, CA 95053.

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