

1985年冬季模拟会议文集

**1985 WINTER
SIMULATION CONFERENCE
PROCEEDINGS**

1985 WINTER SIMULATION CONFERENCE PROCEEDINGS

Edited by:

**DONALD T. GANTZ
GEORGE MASON UNIVERSITY**

**GERARD C. BLAIS
FEDSIM**

**SUSAN L. SOLOMON
CALIFORNIA STATE UNIVERSITY, SACRAMENTO**

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FROM THE EDITORS

Welcome to the 1985 Winter Simulation Conference. We hope you enjoy your visit to San Francisco and find time to sample the cuisine, scenery and culture.

We are pleased to present to you the 1985 Winter Simulation Conference *Proceedings*. As a permanent record of 1985 WSC, the *Proceedings* provides access to papers for sessions that you could not attend and is a source of valuable addresses which will allow you to follow up on contacts initiated at the conference.

This year's program follows the traditional WSC format. We have a keynote address followed by six parallel tracks with nine sessions in each. We are pleased to have David C. Evans as our keynote speaker. Dr. Evans is cofounder and currently Chief Executive of Evans & Sutherland Computer Corporation which has pioneered the development and application of real-time 3-D graphics technology. His keynote speech is titled "The Art of Visual Simulation."

The six parallel tracks include education and software tutorials, panel discussions, simulation methodology sessions and two tracks on applications. The tutorials provide overviews of general simulation approaches and in-depth coverage of some of the available simulation software. The methodology track presents recent contributions of the authors in new methodologies for modeling and analysis. The two tracks of applications include a variety of topics from the use of simulation in management and decision making to military applications, from modeling techniques in hospital operations to manufacturing. It is our hope that in these sessions you will hear both recent developments in familiar applications as well as innovative and stimulating approaches being explored in the research environment.

We would like to thank the Board of the Winter Simulation Conference for their continued assistance during the planning period. Particularly, we would like to express our appreciation of Lawrence Sashkin who served as our liaison to the Board and to Thomas J. Schriber and A. Alan B. Pritsker who were Board Chairmen during the planning period for this conference. We would also like to express our thanks to the other members of the 1985 Winter Simulation Committee who gave so much of their time and have served with distinction in preparing for this conference. In particular, we appreciate the efforts of Steven Roberts who prepared the Preliminary Program and Duane Ball who submitted and monitored budgets for the sponsoring societies. We would also like to acknowledge the contributions of Denis LeClair in preparing the Programs and the *Proceedings* for publication.

The 1986 Winter Simulation Conference will be held in Washington, D.C. Already planning that Conference are James Henriksen, General Chairman, and Steven Roberts, Program Chairman. Please share with them your comments on this year's conference as well as your suggestions and offers of assistance for WSC 1986. A conference of this magnitude requires the help of many people: do not hesitate to join the team which will be working to make WSC 1986 a successful undertaking.

Finally, we wish to thank the many participants in WSC 1985 for unselfishly giving their time to make this year's conference successful. This includes the session chairpersons, presenters, panel members, paper reviewers and exhibitors. We thank all attendees and hope that you enjoy the conference and your visit to San Francisco.

Donald T. Gantz,
Proceedings Editor

Gerard C. Blais
General Chairman

Susan L. Solomon
Program Chairman

ABOUT THE EDITORS

Donald T. Gantz is an Associate Professor of Systems Engineering at George Mason University, Fairfax, Virginia. He teaches courses in Computer Simulation, Stochastic Systems, Control, and Applied Statistics. He earned his Ph.D. at the University of Rochester where his work was in stochastic processes. He has worked for several years in modeling and analysis for the evaluation of flight test data. He has also done considerable work in management systems, particularly with respect to risk assessment and management. He is currently developing a Decision Support System for innovative transportation funding for the Department of Transportation.

Gerard C. Blais is the Deputy Director for Design Assessment of the Federal Computer Performance Evaluation and Simulation Center. He received a B.S. from the Rensselaer Polytechnic Institute. He currently maintains two languages for simulation of computer and communication systems: the Extendable Computer System Simulator (ECSS II) and A Computer Modeling System (ACMS II). He has simulated computer systems for many government agencies, including both general-purpose and special-purpose, real-time processors. His current interests include the application of Very High Speed Integrated Circuits (VHSIC) technology to signal processing in a distributed architecture.

Susan L. Solomon is Professor of Management Information Science in the School of Business and Public Administration at California State University, Sacramento. Previously she was on the faculty at Eastern Washington University, the University of Maryland and Hofstra University. Earlier she was a systems engineer with IBM and a statistical analyst at Cornell Aeronautical Laboratory.

She received her undergraduate degree cum laude in economics from Radcliffe College and an M.S. degree in operations management from U.C.L.A. Her Ph.D. was awarded by the University of California at Berkeley in operations management and information science (business administration).

Dr. Solomon is currently Associate Technical Editor for Discrete Systems for *SIMULATION*, a position she has held for the past five years. She has served as Chairman, Vice-Chairman and Treasurer of ACM/SIGSIM. She is a member of The Society for Computer Simulation, The Institute of Management Sciences and the American Institute for Decision Sciences.

Dr. Solomon's professional interests range from simulation languages and statistical analysis to the practical aspects of hardware and software acquisition by small business. She has contributed numerous papers to professional journals such as *Decision Sciences* and *Interfaces*, and to conferences such as the Winter and Summer Simulation Conferences and national and regional meetings of the American Institute for Decision Sciences. Her textbook, *Simulation of Waiting-Line Systems*, was published by Prentice-Hall in 1973.

THE WINTER SIMULATION CONFERENCES

Conference	General Chairman Program Chairman
1. Conference on the Applications of Simulation Using GPSS November, 1967 Hotel Roosevelt, New York, NY	Harold Hixson Julian Reitman
2. Second Conference on the Applications of Simulation December, 1968 Hotel Roosevelt, New York, NY	Julian Reitman Arnold Ockene
3. Third Conference on the Applications of Simulation December, 1969 International Hotel, Los Angeles, CA	Arnold Ockene Philip J. Kiviat
4. Fourth Conference on the Applications of Simulation December, 1970 Waldorf-Astoria Hotel, New York, NY	Philip J. Kiviat Michel Araten
5. The 1971 Winter Simulation Conference December, 1971 Waldorf-Astoria Hotel, New York, NY	Michel Araten Joseph Sussman
6. The 1973 Winter Simulation Conference January, 1973 St. Francis Hotel, San Francisco, CA	Joseph Sussman Austin Hoggatt
7. The 1974 Winter Simulation Conference January, 1974 Washington Hilton Hotel, Washington, DC	Michael F. Morris Harold Steinberg
8. The 1976 Bicentennial Winter Simulation Conference December, 1976 National Bureau of Standards, Gaithersburg, MD	Harold J. Highland Thomas J. Schriber
9. The 1977 Winter Simulation Conference December, 1977 National Bureau of Standards, Gaithersburg, MD	Robert G. Sargent J. William Schmidt
10. The 1978 Winter Simulation Conference December, 1978 The Deauville Hotel, Miami Beach, FL	Larry G. Hull Norman R. Nielsen
11. The 1979 Winter Simulation Conference December, 1979 Holiday Inn Embarcadero, San Diego, CA	Mitchell G. Spiegel Robert Shannon
12. The 1980 Winter Simulation Conference December, 1980 Orlando Marriott, Orlando, FL	Paul Roth Tuncer I. Oren
13. The 1981 Winter Simulation Conference December, 1981 Peachtree Plaza, Atlanta, GA	Claude M. Delfosse Charles M. Shub
14. The 1982 Winter Simulation Conference December, 1982 Holiday Inn Embarcadero, San Diego, CA	Yen W. Chao Orlando Madrigal

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| 15. | The 1983 Winter Simulation Conference
December, 1983
Marriott Crystal Gateway Hotel, Arlington, VA | Jerry Banks
Bruce Schmeiser |
| 16. | The 1984 Winter Simulation Conference
November, 1984
Sheraton Dallas Hotel, Dallas, TX | Udo W. Pooch
C. Dennis Pegden |
| 17. | The 1985 Winter Simulation Conference
December, 1985
San Francisco Hilton and Tower, San Francisco, CA. | Gerard C. Blais
Susan Solomon |

1985 WINTER SIMULATION CONFERENCE SPONSORING ORGANIZATIONS

ASA:	American Statistical Association
ACM/SIGSIM:	Association for Computing Machinery Special Interest Group on Simulation
IEEE/CS:	Institute of Electrical and Electronic Engineers Computer Society
IEEE/SMC:	IEEE – Systems, Man, and Cybernetics Society
IIE:	Institute of Industrial Engineers
NBS:	National Bureau of Standards
ORSA:	Operations Research Society of America
SCS:	The Society for Computer Simulation
TIMS/CSG:	The Institute of Management Science College on Simulation and Gaming

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Keynote Speaker: Dr. David C. Evans



Keynote Address: The Art of Visual Simulation

Dr. David C. Evans

Wednesday, December 11 • 9:00 A.M. - 10:30 A.M.

For about twenty years the operators of simulated vehicles have been provided with out-the-window views of the environment which are generated in real time by computers. The available technology has not permitted these computer generated images to closely approximate real world scenes. With some insights provided by models of human vision, a very useful visual simulation art has developed. This art will be described and demonstrated.

Keynote Speaker:

Dr. David C. Evans is cofounder and currently Chief Executive of Evans & Sutherland Computer Corporation which has pioneered the development and application of real-time 3-D graphics technology. He has been Professor of Computer Science and Electrical Engineering at the University of Utah and at the University of California at Berkeley. He was formerly Director of Engineering of the Computer Division of the Bendix Corporation.

Dr. Evans is recognized as a pioneer developer of interactive computer systems, including professional personal computing systems, time-sharing systems and computer graphics. He is a member of the National Academy of Engineering and a Fellow of IEEE.

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