

# David M. Nicol

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October 7, 2009

## Education

Ph.D.	Computer Science	University of Virginia	1985
M.S.	Computer Science	University of Virginia	1983
B.A.	Mathematics (Phi Beta Kappa)	Carleton College	1979

## Employment

*Professor of Electrical and Computer Engineering* *University of Illinois at Urbana-Champaign*  
September 2003–current.  
Chair, Computer Engineering Group, August 2004-August 2007.

*Acting Director* *ISTS*  
May 2003–August 2003.

*Assoc. Director for Research and Development* *ISTS*  
July 2002–May 2003.

*Professor of Computer Science* *Dartmouth College*  
1998–2003.  
Chair: July 2000–July 2002.  
Sabbatical—Spring 2000: Oxford University Department of Computing .

*Associate Professor of Computer Science* *Dartmouth College*  
1996–1998.  
Vice Chair : July 1999-June 2000.

*Associate Professor of Computer Science* *College of William and Mary*  
1992–1996.  
Sabbatical—Fall 1993 through Spring 1994 : Institute for Computer Application Studies, and Carleton College.

*Assistant Professor of Computer Science* *College of William and Mary*  
1987–1992.

*Staff Scientist* *ICASE, NASA Langley Research Center*  
1985–1987.

*Programmer Analyst* *Control Data Corporation*  
1979–1982.  
Design Lead 1980-1982, CDC Site Representative ABLE System, Zweibruecken AFB West Germany, 1982.

## **Honors and Awards**

Best Paper Award, Conference on Principles of Advanced and Distributed Simulation, 2008.

ACM SIGSIM Distinguished Contributions Award, inaugural winner, 2007.

Fellow of the ACM, 2006.

Best Paper Award, Conference on Principles of Advanced and Distributed Simulation, 2005.

Best Paper Award, IPSI-2004 Studencia Conference, 2004.

IEEE Fellow, 2003.

Marion and Jason Whiting Fellowship for study at Oxford University, 2000.

Best Paper Award, 9<sup>th</sup> Annual Conference on Parallel and Distributed Simulation, 1995.

Alumni Fellowship Award, given by the William and Mary Society of the Alumni for excellence in teaching, 1992.

Great Performer's Award (1980), Employee Excellence Award (1982) Control Data Corporation.

## Consulting

- Consultant* *Institut National de Recherche en Informatique et Automatique (INRIA)*  
Led team of international experts in assessing 11 INRIA multi-year research programs in high performance computing on distributed Grid networks. 2008.
- Consultant* *Department of Homeland Security*  
Assessment of DHS program in process modeling of coupled critical infrastructures. 2006.
- Consultant* *NASA*  
Assessment of a proposed NASA standard for simulation model development, experimental design, documentation, and reporting. 2006.
- Consultant* *Sandia National Laboratories*  
Aid in design of distributed simulation language and toolset for internal Sandia use, study of distributed simulations of DoE complex enterprise systems, study of utility of fluid based communication models, design of wireless systems in critical infrastructure communications. 1996-2006.
- Consultant* *National Science Foundation*  
Assess research proposals in the areas of high performance computing, performance evaluation, and computer/communication security. 1987-present.
- Consultant* *GRCI Corporation*  
Assist system architect Emmet Beeker in GRCI contract proposal development for high performance analytic military simulations. 2000-2003.
- Developer* *Supercomputing 99, 00, 01, and 02 Conferences*  
Developed, maintained and operated web sites for technical conference and tutorial submission, management, and evaluation. Provide technical assistance for authors, reviewers, and program committee. People I trained for the Supercomputing contract have turned this into a business.
- Consultant* *Universities Space Research Association*  
Assisted USRA in preparation of \$5M/year proposal to NASA for development of a Research Center in Earth Sciences. 1999.
- Science Council* *Center of Excellence in Space Data and Information Science, NASA Goddard Space Center*  
Served on CESDIS technical oversight board, making program recommendations to NASA Goddard. Member 1995-1999. Served as chair, 1998-1999.
- Consultant* *ATT Research*  
Worked with Albert Greenberg and Boris Lubachevsky on problems in parallel simulation of computer and communication networks. 1992-1996.
- Consultant* *IBM Research*  
Worked with Phil Heidelberger on problems in parallel simulation of computer and communication networks. 1992-1996.
- Consultant* *Institute for Computer Applications in Science and Engineering*  
Did basic research in control and modeling of high performance computations motivated by problems of interest to NASA, particularly reliability modeling. Developed and managed a visitors program for ICASE in performance and reliability analysis. 1987-1996.

## Research Interests

Analysis of computer and communication systems, particularly with respect to security (attacks, and defensive measures); quantitative methods for security evaluation. High performance computing, parallel algorithms. Modeling and simulation methodologies.

## Funding

PI and co-PI on \$58,604,860 of awarded support since 1988.

### AWARDED

<b>Rockwell-Collins</b> , \$450,000, 2008-2010 <i>COTS Architecture for Multi-level Security</i> , co-PI : William Sanders.	PI
<b>Air Force</b> , \$83,800, 2009-2010 <i>DURIP : Timing Traffic Analysis Testbed</i> , co-PI : William Sanders, Negar Kiyavash, Todd Coleman	co-PI
<b>EPRI</b> , \$50,000, 2008-2009 <i>Evaluation of Secure Authentication Supplement of the DNP3 Specification</i> , co-PI : William Sanders, Himanshu Khurana	co-PI
<b>I3P/DHS</b> , \$500,000, 2007-2009 <i>Global Policy for Survivable Process Control Networks</i> co-PI : William Sanders.	PI
<b>I3P/DHS</b> , \$600,000, 2007-2009 <i>End-to-End Assessment of Identity Management Systems</i> co-PI : William Sanders, Carl Gunter.	PI
<b>NSF</b> , \$500,000, 2008-2011 <i>CT-ISG: Traffic Analysis : Attacks, Defenses, and Fundamental Limits</i> , co-PIs : Nikita Borisov, Todd Coleman, Negar Kiyavash	co-PI
<b>Dept. of Energy</b> , \$250,000 9/08-9/09 <i>Trustworthy Communication Architecture for Converged SCADA Applications</i> , co-PIs : William Sanders, Himanshu Khurana	co-PI
<b>NSF</b> , \$412,000, 2006-2009 <i>Survivable Trust for Critical Infrastructure: Detecting and Preventing Attacks with Vulnerability Signatures</i> , co-PIs : William Sanders, Nikita Borisov.	co-PI
<b>NSF</b> , \$7,500,000, 2005-2010 <i>Trustworthy Cyber Infrastructure for the Power Grid</i> , co-PIs : William Sanders, Ravi Iyer, Roy Campbell, Peter Sauer.	co-PI
<b>I3P</b> , \$240,000, 2005-2007 <i>Unifying Stakeholders and Security Programs to Address SCADA Vulnerability and Infrastructure Interdependencies</i> co-PI : William Sanders.	co-PI
<b>Boeing</b> , \$484,000, 2005-2009 <i>Algorithms for Quantifying Security and Survivability</i> , co-PI : William Sanders.	co-PI
<b>NSF</b> , \$360,000, 2002-2005 <i>Survivable Trust for Critical Infrastructure</i> co-PIs : Sean Smith, Chris Hawblitzel .	co-PI
<b>Mellon Foundation</b> , \$1,649,977, 2002-2003 <i>Transforming Academic Computing with Public Key Infrastructure</i> PI : Sean Smith Co-PIs : Bob Brentrup, Larry Levine.	co-PI

<i>David M. Nicol (Funding)</i>	5
<b>Department of Justice</b> , \$18,000,000, 2002-2003 <i>Institute for Security Technology Studies.</i> <i>Institute for Information Infrastructure Protection.</i>	PI
<b>Department of Justice</b> , \$15,000,000, 2000-2001 <i>Institute for Security Technology Studies.</i> PI Susan Prager, Provost of Dartmouth College. Co-PIs : Lewis Duncan, George Cybenko, Joseph Henderson.	co-PI
<b>Internet2 and ATT</b> , \$200,000, 2000-2002 <i>Internet2 PKILab.</i> Co-PIs : Sean Smith, Larry Levine.	co-PI
<b>DARPA</b> , \$1,700,000, 2000-2003. <i>Spatio-Temporal Dynamics of the Global Internet.</i>	PI
<b>NSF</b> , \$1,400,000, 1998-2003 <i>Systems Science for Physical Geometric Algorithms.</i> NSF Research Infrastructure award. Co-PIs : David Kotz, Dan Rockmore, Bruce Donald.	PI
<b>NSF</b> , \$224,000, 1998-2001 <i>A Fluid Methodology and Tool for Complex Large-Scale Networks.</i>	PI
<b>DARPA</b> , \$3,310,931, 1996-1999 <i>Scalable Self-Organizing Simulations.</i> co-PI : Andrew Ogielski.	co-PI
<b>NSF</b> , \$1,500,000, 1995-1998 <i>Simulations Of Integrated Communications Systems</i> co-PIs: Andrew Ogielski, Richard Fujimoto, Diane Souvaine.	co-PI
<b>NSF</b> , \$125,918 <i>Acquisition of a Parallel Graphics Computer for Inter-disciplinary Research</i>	co-PI
<b>NASA</b> , \$20,000, 1995-1996 <i>Reliability Interface Tool Extension.</i>	PI
<b>CACC</b> , \$16,000, 1995-1996 <i>Integrated Modeling .</i>	PI
<b>Center for Innovative Technology</b> , \$39,989, 1995 <i>Integrated Environment for performance, reliability, and availability modeling</i>	PI
<b>NASA</b> , \$135,000, 1992-1995 <i>Parallel Algorithms for the Simulation and Analysis of Discrete Time Petri Nets.</i>	PI
<b>NSF</b> , \$131,000, 1992-1995 <i>Static and Dynamic Load Balancing of Parallel Discrete-Event Simulations on Distributed Memory Architectures.</i>	PI
<b>NASA</b> , \$57,500, 1989-1992 <i>Parallelization of Performance Tools.</i>	PI
<b>NASA</b> , \$110,000, 1990-1993 <i>The Reliability Estimation System Testbed.</i>	PI
<b>NSF</b> , \$104,000, 1989-1992 <i>Automated Methods for Run-Time Performance Optimization of Sparse and Irregular Numerical Applications.</i>	PI

<b>US Army</b> , \$178,000, 1988-1991 <i>Reliable Real-Time Processing of Sensor Data in Embedded Avionics Computing Systems .</i> Co-PIs : Steve Park, Phil Kearns.	co-PI
<b>NASA</b> , \$105,000, 1990-1992 <i>Writing Software for 2010.</i> co-PI: Keith Miller	co-PI
<b>NASA</b> , \$78,745, 1989-1990 <i>Parallelization of ERBE Data Processing.</i>	PI
<b>Center for Innovative Technology</b> , \$39,000, 1989-1990 <i>Parallelization of Performability Design Tools .</i>	PI
<b>NASA</b> , \$25,000, 1989-1990 <i>Hypercube Equipment Grant.</i>	PI
<b>DFL Ltd.</b> , \$25,000, 1988-1989 <i>Mapping Issues in Parallel Simulations.</i>	PI

## Publications

Author and co-author on 189 refereed journal and conference papers since 1984, and co-author of one widely used textbook.

### PH.D. DISSERTATION

1. David M. Nicol  
The Automated Partitioning of Simulations for Parallel Execution  
Ph.D. thesis, University of Virginia, August 1985.

### BOOKS

1. Jerry Banks, John Carson, Barry Nelson and David Nicol  
Discrete-Event System Simulation.  
*Prentice-Hall*, 3<sup>rd</sup> Edition (2000), 4<sup>th</sup> Edition (2005), 5<sup>th</sup> Edition (2009)

### JOURNAL PUBLICATIONS

- J1. Models of Privacy Preserving Traffic Tunneling  
David M. Nicol and Nabil Schear  
*Simulation : Transactions of the Society for Modeling and Simulation International*  
85(9):589-607, 2009
- J2. A Testbed for Power System Security Evaluation  
David M. Nicol, Matt Davis and Tom Overbye  
*International Journal of Information and Computer Security*  
2009  
to appear.
- J3. Application of Trusted Network Technology to Industrial Control Networks  
Hamed Okhravi and David M. Nicol  
*International Journal of Critical Infrastructure Protection*  
2009  
To appear.
- J4. Useable Global Network Access Policy for Process Control Systems  
David M. Nicol, William H. Sanders, Sankalp Singh and Mouna Seri  
*IEEE Security & Privacy*  
6(6):30-36, Nov.-Dec. 2008
- J5. Evaluation of Patch Management Strategies  
Hamed Okhravi and David M. Nicol  
*International Journal of Computational Intelligence : Theory and Practice*  
3(2):103-111, December 2008
- J6. Efficient Simulation of Internet Worms  
David M. Nicol  
*ACM Transactions on Modeling and Computer Simulation*  
18(2):5:1-5:32, 2008
- J7. RINSE: the Real-time Interactive Network Simulation Environment for Network Security Exercises  
M. Liljenstam, D.M. Nicol, Y. Yuan, G. Yan and J. Liu  
*Simulation : Transactions of the Society for Modeling and Simulation International*  
82(1):43-59, Jan. 2006

- J8. High Performance Simulation of Low-Resolution Network Flows  
D.M. Nicol G. Yan  
*Simulation : Transactions of the Society for Modeling and Simulation International*  
82(1):21-42, Jan. 2006
- J9. Modeling and Simulation in Security Evaluation  
David M. Nicol  
*IEEE Security and Privacy*  
September/October , pp. 71-74
- J10. The Performance Impact of BGP Security  
M. Zhao, S.W. Smith and D. M. Nicol  
*IEEE Network*  
November/December , pp. 42-48
- J11. Empirical Validation of Wireless Models in Simulations of Ad Hoc Routing Protocols  
*Simulation : Transactions of the Society for Modeling and Simulation International*  
81(4):307-323, 2005
- J12. Model-Based Evaluation: From Dependability to Security  
David M. Nicol, William H. Sanders and Kishor S. Trivedi  
*IEEE Trans. on Dependability and Security*  
1(1):48-65, 2004
- J13. Evaluation of Efficient Security for BGP Route Announcements using Parallel Simulation  
David M. Nicol, Sean Smith and Meiyuan Zhao  
*Simulation Practice and Theory*  
12(3-4):187-216, 2004
- J14. Utility Analysis of Network Simulators  
David M. Nicol  
*International Journal of Simulation : Systems, Science, and Technology*  
2003
- J15. Discrete-Event Fluid Modeling of TCP Background Traffic  
David M. Nicol and Guanhua Yan  
*ACM TOMACS*  
14(3):211-250, 2004
- J16. On k-ary n-cubes : Theory and Applications  
Weizhen Mao and David M. Nicol  
*Discrete Applied Mathematics*  
129(1):171-193, 2003
- J17. Composite Synchronization for Parallel Discrete Event Simulation  
David Nicol and Jason Liu  
*IEEE Transactions on Parallel and Distributed Systems*  
13(5):433-446, May 2002  
To appear.
- J18. A Geographically Distributed Enterprise System  
Heidi Ammerlahn, David Nicol, Michael Goldsby and Michael Johnson  
*Future Generation Computer Systems*  
17(2):135-146, October 2000
- J19. Modeling the Global Internet  
James Cowie, David Nicol and Andy Ogielski  
*IEEE Computing in Science and Engineering*  
1(1):42-50, Jan.-Feb. 1999

- J20. Simulation of Fluid Stochastic Petri Nets  
Gianfranco Ciardo, David Nicol and Kishor Trivedi  
*IEEE Transactions on Software Engineering*  
25(2):207-217, March/April 1999
- J21. Performing Out-of-Core FFTs on Parallel Disk Systems  
Tom Cormen and David Nicol  
*Parallel Computing*  
24(1):5-20, January 1998
- J22. Out-of-Core FFTs with Parallel Disks  
Tom Cormen and David Nicol  
*ACM Performance Evaluation Review*  
25(3):3-12, December 1997
- J23. Automated Parallelization of Discrete State-space Generation  
David Nicol and Gianfranco Ciardo  
*Journal of Parallel and Distributed Computing*  
volume 47, 47 1997, pp. 153-167
- J24. Balancing Contention and Synchronization on the Intel Paragon  
Shahid Bokhari and David Nicol  
*IEEE Concurrency*  
5(2):74-84, April-June 1997
- J25. Transformation of ns TCP Models to TED  
Brian Premore and David Nicol  
*ACM Performance Evaluation Review*  
25(4):40-48, March 1998
- J26. Fluid Stochastic Petri Nets: Theory Applications and Solution Techniques  
Graham Horton, David Nicol, V. Kulkarni and Kishor Trivedi  
*European Journal of Operational Research*  
105(1):184-201, February 1998
- J27. Distributed State Space Generation of Discrete-State Stochastic Models  
Gianfranco Ciardo, David Nicol and Josh Gluckman  
*INFORMS Journal on Computing*  
10(1):82-93, January 1998
- J28. Conference Program Management Using the Internet  
David Nicol  
*IEEE Computer*  
29(3):112-113, March 1996
- J29. Parallelized Direct Execution Simulation of Message Passing Programs  
Phillip Dickens, David Nicol and Philip Heidelberger  
*IEEE Transactions on Parallel and Distributed Systems*  
7(10):1090-1105, October 1996
- J30. Analytic Comparison of Bounded Time Warp and YAWNS  
Phillip Dickens, David Nicol, Paul Reynolds and Mark Duva  
*ACM Transactions on Modeling and Computer Simulation*  
6(4):297-320, October 1996
- J31. Parallel Execution for Serial Simulators  
David Nicol and Philip Heidelberger  
*ACM Transactions on Modeling and Computer Simulation*  
6(3):210-242, July 1996

- J32. Efficient Bulk-Loading of Gridfiles  
Scott Leutenegger and David Nicol  
*IEEE Transactions on Knowledge and Data Engineering*  
9(3):410-420, May/June 1997
- J33. Static Assignment of Complex Tasks using Stochastic Majorization  
David Nicol, Rahul Simha and Don Towsley  
*IEEE Transactions on Computers*  
45(6):730-741, June 1996
- J34. A Comparative Study of Parallel Algorithms for Simulating Continuous Time Markov Chains  
David Nicol and Philip Heidelberger  
*ACM Transactions on Modeling and Computer Simulation*  
5(4):326-354, October 1995
- J35. On Bottleneck Partitioning of  $k$ -ary  $n$ -cubes  
David Nicol and Weizhen Mao  
*Parallel Processing Letters*  
6(6):389-399, June 1996
- J36. Isomorphic Routing on Torodial Meshes  
Weizhen Mao and David Nicol  
*ORSA Journal on Computing*  
8(1):63-73, Winter 1996
- J37. Integrating Reliability Analysis with a Performance Tool  
David Nicol, Dan Palumbo and Michael Ulrey  
*Communications in Reliability Maintainability and Supportability*
- J38. Automated Parallel Simulation of Timed Petri-Nets  
David Nicol  
*Journal of Parallel and Distributed Computing*  
29(1):60-74, August 1995
- J39. Non-committal Barrier Synchronization  
David Nicol  
*Parallel Computing*  
volume 21, 1995, pp. 529-549
- J40. Reliability Analysis of Complex Models Using SURE Bounds  
David Nicol and Dan Palumbo  
*IEEE Transactions on Reliability*  
44(1):46-53, March 1995
- J41. Rectilinear Partitioning of Irregular Data Parallel Computations  
David Nicol  
*Journal of Parallel and Distributed Computing*  
23(2):119-134, November 1994
- J42. Massively Parallel Algorithms for Trace-Driven Cache Simulations  
David Nicol, Albert Greenberg and Boris Lubachevsky  
*IEEE Transactions on Parallel and Distributed Systems*  
5(8):849-859, August 1994
- J43. On the Minimum of a Set of Independent Geometrically Distributed Random Variables  
Gianfranco Ciardo, David Nicol and Larry Leemis  
*Statistics and Probability Letters*  
volume 23, 1995, pp. 313-326

- J44. Assignment of Processors for Pipeline Computations  
Alok Choudhary, Bhagirath Harahari, David Nicol and Rahul Simha  
*IEEE Transactions on Parallel and Distributed Systems*  
5(4):439-445, April 1994
- J45. A Sweep Algorithm for Massively Parallel Simulation of Circuit-Switched Networks  
Bruno Gaujal, Albert Greenberg and David Nicol  
*Journal of Parallel and Distributed Computing*  
18(4):484-500, August 1993
- J46. Optimistic Parallel Simulation of Markov Chains Using Uniformization  
David Nicol and Philip Heidelberger  
*Journal of Parallel and Distributed Computing*  
18(4):395-410, August 1993
- J47. Parallel Simulation Today  
David Nicol and Richard Fujimoto  
*Annals of Operations Research*  
volume 53, December 1994, pp. 249-286
- J48. Conservative Parallel Simulation of Markov Chains Using Uniformization  
Philip Heidelberger and David Nicol  
*IEEE Transactions on Parallel and Distributed Systems*  
4(8):906-921, August 1993
- J49. The Cost of Conservative Synchronization in Parallel Discrete-Event Simulations  
David Nicol  
*Journal of the ACM*  
40(2):304-333, April 1993
- J50. Conservative Parallel Simulation of Priority Class Queueing Networks  
David Nicol  
*IEEE Transactions on Parallel and Distributed Systems*  
3(3):294-303, May 1992
- J51. Inflated Speedups in Parallel Simulations via `malloc()`  
David Nicol  
*International Journal on Simulation*  
volume 2, , pp. 413-426
- J52. Improved Algorithms for Mapping Pipelined and Parallel Algorithms  
David Nicol and David O'Hallaron  
*IEEE Transactions on Computers*  
40(3):295-306, March 1991
- J53. Estimating the Probability of Failure When Testing Reveals No Failures  
Keith Miller, L. Morell, David Nicol, Richard Noonan, Steve Park, Branson Murrill and  
Jeff Voas.  
*IEEE Transactions on Software Engineering*  
18(1):33-42, January 1992
- J54. Performance Bounds on Self-Initiating Parallel Discrete Event Simulations  
David Nicol  
*ACM Transactions on Modeling and Computer Simulation*  
1(1):24-50, 1990
- J55. A Multi-stage Linear Array Assignment Problem  
Rex Kincaid, David Nicol, Dana Richards and Doug Shier  
*Operations Research*  
38(6):993-1005, Nov.-Dec. 1990

- J56. An Analysis of Scatter Decomposition  
David Nicol and Joel Saltz  
*IEEE Transactions on Computers*  
39(11):1337-1345, November 1990
- J57. Parallelization of Sparse Dynamic Programming Problems  
David Nicol  
*ORSA Journal on Computing*  
2(2):162-173, Spring 1990
- J58. Optimal Dynamic Remapping of Data Parallel Computations  
David Nicol and Paul Reynolds, Jr.  
*IEEE Transactions on Computers*  
39(2):206-219, February 1990
- J59. Delay Point Schedules for Irregular Parallel Computations  
David Nicol, Joel Saltz and James Townsend  
*International Journal on Parallel Programming*  
18(1):69-90, February 1989
- J60. Optimal Partitioning of Random Programs Across Two Processors  
David Nicol  
*IEEE Transactions on Software Engineering*  
15(2):134-141, February 1989
- J61. Dynamic Remapping of Parallel Computations with Varying Resource Demands  
David Nicol and Joel Saltz  
*IEEE Transactions on Computers*  
37(9):1073-1087, September 1988
- J62. Problem Size, Parallel Architecture, and Optimal Speedup  
David Nicol and Frank Willard  
*Journal of Parallel and Distributed Computing*  
volume 5, August 1988, pp. 404-420
- J63. Expected Performance of m-Solution Backtracking  
David Nicol  
*SIAM Journal on Computing*  
17(1):114-127, February 1988
- J64. Reduction of the Effects of the Communication Delays in Scientific Algorithms on  
Message Passing MIMD Architectures  
Joel Saltz, Vijay Naik and David Nicol  
*SIAM Journal on Scientific and Statistical Computing*  
volume 8, number 1, January 1987

CONFERENCE PUBLICATIONS

- C1. GPU Coprocessing for Wireless Network Simulation  
S. Bai and D. M. Nicol  
*Proceedings of the 2009 Symposium on Application Accelerators in High Performance Computing*  
Urbana, Illinois
- C2. PolicyGlobe: A Framework for Integrating Network and Operating System Security Policies  
H. Okhravi and D. M. Nicol  
*Proceedings of CCS 2009 Workshop on Assurable & Usable Security Configuratin (Safe-Config)*  
Chicago, IL  
to appear
- C3. TrustGraph: Trusted Graphics Subsystem for High Assurance Systems  
H. Okhravi and D. M. Nicol  
*Proceedings of the IEEE Annual Computer Security Applications Conference (ACSAC'09)*  
Honolulu, HI  
to appear
- C4. Experiences Validating the Access Policy Tool in Industrial Settings  
D. M. Nicol, W. H. Sanders, M. Seri and S. Singh  
*Proceedings of Hawaii International Conference on System Sciences*  
Honolulu, HI  
to appear
- C5. A Calculus of Trust and Its Application to PKI and Identity Management  
J. Huang and D. M. Nicol  
*Proceedings of IDTrust 2009*  
NIST, Gaithersburg, MD, pp. 23-37
- C6. A Virtual Power System Testbed for Cyber-Security Decision Support  
D. M. Nicol, C. M. Davis and T. Overbye  
*Proceedings of the 2009 INFORMS Simulation Society Workshop on Simulation: At the Interface of Modeling and Analysis*  
University of Warwick, UK
- C7. Performance Analysis of Real Traffic Carried with Encrypted Cover Flows  
N. Schear and D. M. Nicol  
*Proceedings of the 2008 Conference on Principles of Advanced and Distributed Simulation*  
Rome, Italy, June 2008
- C8. Application of Trusted Network Technology to Industrial Control Networks  
H. Okhravi and D. M. Nicol  
*2<sup>nd</sup> IFIP WG 11.10 International Conference on Critical Infrastructure Protection*  
Fairfax, VA, March 2008
- C9. Analysis of Local Address Scanning by Puppetnets  
*Proceedings of the 2007 Conference on Quantitative Evaluation of Systems*  
Edinburgh, Scotland, September 2007, pp. 258-268
- C10. Modeling Worm Defense Using Stochastic Activity Networks  
D. M. Nicol, S. Hanna, F. Stratton and W. Sanders  
*Proceedings of the 2007 Symposium on Simulation of System Security*  
Norfolk, VA, April 2007
- C11. Tradeoffs Between Model Abstraction, Execution Speed, and Accuracy  
*Proceedings of the International Mediterranean Simulation Multiconference*  
Barcelona, Spain, October 2006, pp. 13-20

- C12. Top Speed of Flash Worms Revisited  
*Proceedings of the International Mediterranean Simulation Multiconference*  
Barcelona, Spain, October 2006, pp. 21-30
- C13. The Impact of Stochastic Variability on Worm Detection  
David M. Nicol  
*Proceedings of 2006 ACM Conference on Computer and Communications Security (CCS 2006)*  
Alexandria, VA, November 2006
- C14. Detection of Nuclear Material at Border Crossings by Correlating Movement and Radiation Measurements  
David M. Nicol, Rose Tsang, Heidi Ammerlahn and Michael Johnson  
*Proceedings of the 2006 Winter Simulation Conference*  
Monterey, CA, December 2006
- C15. Aggregated Path Authentication for Efficient BGP Security  
M. Zhao, S. Smith and D. Nicol  
*Proceedings of the 2005 ACM Conference on Computer and Communications Security (CCS 2005)*  
Alexandria, VA, November 2005, pp. 128–138
- C16. Evaluating the Performance Impact of PKI on BGP Security  
M. Zhao, S. Smith and D. Nicol  
*4<sup>th</sup> Annual PKI R&D Workshop*  
Gaithersburg, MD, April 2005
- C17. Simulation of Binary Code Protection  
D. Nicol and H. Okhravi  
*Proceedings of 2005 Winter Simulation Conference*  
Orlando, FL, December 2005
- C18. Advanced Concepts in Network Simulation  
D. Nicol, M. Liljenstam and J. Liu  
*Proceedings of 2005 Winter Simulation Conference*  
Orlando, FL, December 2005
- C19. Models and Analysis of Active Worm Defense  
D. Nicol  
*Proceedings of Mathematical Methods, Models and Architectures for Computer Networks Security Workshop*  
St. Petersburg, Russia, September 2005 (To appear)
- C20. Simulation of Network Traffic at Coarse Time-scales  
D.M. Nicol and G. Yan  
*Proceedings of the 2005 Conference on Principles of Advanced and Distributed Simulation*  
Monterey, CA, June 2005
- C21. RINSE: the Real-time Interactive Network Simulation Environment for Network Security Exercises  
M. Liljenstam, D.M. Nicol, Y. Yuan, G. Yan and J. Liu  
*Proceedings of the 2005 Conference on Principles of Advanced and Distributed Simulation*  
Monterey, CA, June 2005
- C22. Simulation Analysis of Virtual Geographic Routing  
David M. Nicol, Michael E. Goldsby and Michael M. Johnson  
*Proceedings of the 2004 Winter Simulation Conference*  
Washington, DC, December 2004

- C23. Diagnostics for Causes of Packet Loss in a High Performance Data Transfer System  
P. Dickens and D. Nicol  
*Proceedings of the 18th International Parallel and Distributed Processing Symposium (IPDPS 2004)*  
IEEE Computer Society, Santa Fe, New Mexico  
2004
- C24. On-Demand Computation of Policy Based Routes for Large-Scale Network Simulation  
Michael Liljenstam and David M. Nicol  
*Proceedings of the 2004 Winter Simulation Conference*  
Washington, DC, December 2004
- C25. Evaluation of Secure Peer-to-Peer Overlay Routing for Survivable SCADA Systems  
Jeffery J. Farris and David M. Nicol  
*Proceedings of the 2004 Winter Simulation Conference*  
Washington, DC, December 2004, pp. 309-317
- C26. Fast Model-Based Penetration Testing  
James Lyons, David M. Nicol and Sankalp Singh  
*Proceedings of the 2004 Winter Simulation Conference*  
Washington, DC, December 2004
- C27. Vulnerability of BGP to Policy Attacks  
David M. Nicol, Steven Ko, Jintae Kim and George Riley  
*Proceedings of the 2004 Winter Simulation Conference*  
Washington, DC, December 2004
- C28. Comparing Passive and Active Worm Defenses  
Michael Liljenstam and David M. Nicol  
*Proceedings of the 2004 Conference on Quantitative Evaluation of Systems (QEST)*  
Univ. of Twente, Netherlands, October 2004
- C29. Simulation Validation Using Direct Execution of Wireless Ad-hoc Routing Protocols  
Jason Liu, Yougu Yuan, David M. Nicol, Robert S. Gray, Calvin C. Newport, David F. Kotz and Luiz Felipe Perrone  
*Proceedings of the 2004 Conference on Parallel and Distributed Simulation*  
Kunstein, Austria, May 2004
- C30. Development of an Internet Backbone Topology for Large-Scale Network Simulations  
Micheal Liljenstam, Jason Liu and David M. Nicol  
*Proceedings of the 2003 Winter Simulation Conference*  
New Orleans, LA, December 2003, pp. 694-704
- C31. Modeling and Simulation Best Practices for Wireless Ad-hoc Networks  
Luis Felipe Perrone, Yougu Yuan and David M. Nicol  
*Proceedings of the 2003 Winter Simulation Conference*  
New Orleans, LA, December 2003, pp. 685-693
- C32. Simulation of Large-Scale Networks Using SSF  
David M. Nicol, Jason Liu and Micheal Liljenstam  
*Proceedings of the 2003 Winter Simulation Conference*  
New Orleans, LA, December 2003, pp. 650-657
- C33. Multiscale Modeling and Simulation of Worm Effects on the Internet Routing Infrastructure  
D. M. Nicol, M. Liljenstam and J. Liu  
*Proceedings of the Performance Tools 2003 Conference*  
Urbana, IL, September 2003

- C34. Simulating Realistic Network Worm Traffic for Worm Warning System Design and Testing  
M. Liljenstam, D. M. Nicol, V. Berk and R. Gray  
*Proceedings of the 2003 Workshop on Rapid Malcode (WORM)*  
Washington, DC, October 2003, pp. 24-33
- C35. An Implementation of the SSF Scalable Simulation Framework on the Cray MTA  
R. Henry, S. Kahan, J. Liu and David Nicol  
*2003 Conference on Parallel and Distributed Simulation*  
San Diego, CA, June 2003
- C36. Utility Analysis of Parallel Simulation  
David M. Nicol  
*2003 Conference on Parallel and Distributed Simulation*  
San Diego, CA, June 2003
- C37. Simulation of Cyberattacks with Applications in Homeland Defense Training  
Bill Brown, Andrew Cutts, Dennis McGrath, David M. Nicol, Timothy P. Smith and Brett Toefel  
*Proceedings of the AeroSense 2003 Conference*  
Orlando, FL, March 2003
- C38. Using Simulation to Understand Dynamic Connectivity at the Core of the Internet  
David M. Nicol, Brian Premore and Andy Ogielski  
*Proceedings of UKSim 2003*  
Cambridge University, England, April 2003
- C39. Scalability of Garbage Collection in Java-based Discrete-Event Simulators  
David M. Nicol  
*Proceedings of UKSim 2003*  
Cambridge University, England, April 2003
- C40. Scalability of Network Simulators Revisited  
David M. Nicol  
*Proceedings of the Communication Networks and Distributed Systems Modeling and Simulation Conference*  
Orlando, FL, February 2003
- C41. A Mixed Abstraction Level Simulation Model of Large-Scale Internet Worm Infestations  
M. Liljenstam, Y. Yuan, B. Premore and D. Nicol  
*Proceedings of the Tenth IEEE/ACM Symposium on Modeling, Analysis, and Simulation of Computer Telecommunication Systems*  
Fort Worth, TX, October 2002
- C42. Analysis of Composite Synchronization  
David Nicol  
*2002 Conference on Parallel and Distributed Simulation*  
Washington, D.C., May 2002, pp. 115-124
- C43. Lookahead Revisited in Parallel Wireless Simulations  
Jason Liu and David Nicol  
*2002 Conference on Parallel and Distributed Simulation*  
Washington, D.C., May 2002, pp. 79-88
- C44. Towards High Performance Modeling of the 802.11 Wireless Protocol  
Jason Liu, David Nicol, Felipe Perrone and Michael Liljenstam  
*2001 Winter Simulation Conference*  
Arlington, VA, December 2001

- C45. Discrete-Event Fluid Modeling of TCP  
David Nicol  
*2001 Winter Simulation Conference*  
Arlington, VA , December 2001
- C46. Challenges in Using Simulation to Explain Global Routing Instabilities  
David Nicol  
*2002 Conference on Grand Challenges in Simulation*  
San Antonio, TX, January 2002
- C47. Simulation Modeling of Large-Scale Ad-hoc Sensor Networks  
Jason Liu, David Nicol, Felipe Perrone, Michael Liljenstam, Chip Elliot and Dave Pearson  
*European Interoperability Workshop 2001*  
London England, June 2001
- C48. Learning Not to Share  
David Nicol and Jason Liu  
*2001 Conference on Parallel and Distributed Simulation*  
Lake Arrowhead,CA, May 2001, pp. 26-55
- C49. Consistent Modeling of Distributed Mutual Exclusion Protocol Using Optimistic Synchronization  
Malcolm Low and David Nicol  
*2001 Conference on Parallel and Distributed Simulation*  
Lake Arrowhead,CA, May 2001, pp. 137-144
- C50. Lock-free Scheduling of Logical Processes in Parallel Simulation  
Jason Liu and David Nicol  
*2001 Conference on Parallel and Distributed Simulation*  
Lake Arrowhead, CA, May 2000, pp. 22-24
- C51. Cost/Benefit Analysis of Interval Jumping in Power-Control Simulation  
David Nicol and Felipe Perrone  
*2000 Winter Simulation Conference*  
Orlando, FL, December 2000, pp. 425-431
- C52. Using  $N$ -body Algorithms for Interference Computation in Wireless Cellular Simulations  
Felipe Perrone and David Nicol  
*2000 MASCOTS Conference*  
San Fransisco, CA, August 2000, pp. 49-56
- C53. Safe Time-stamps and Large Scale Modeling  
David Nicol, James Cowie and Jason Liu  
*2000 Workshop on Parallel and Distributed Simulation*  
Bologna, Italy, May 2000, pp. 71-78
- C54. An Investigation of Out-Of-Core Parallel Discrete-Event Simulation  
Anna Poplawski and David Nicol  
*1999 Winter Simulation Conference*  
Phoenix, AZ, December 1999, pp. 524-530
- C55. Strategic Directions in Simulation Research  
David Nicol, Osman Balci, Richard Fujimoto, Paul Fishwick, Pierre L'Ecuyer and Roger Smith  
*1999 Winter Simulation Conference*  
Phoenix, AZ, December 1999, pp. 1509-1520

- C56. Towards Realistic Million-Node Internet Simulations  
James Cowie, David Nicol, Hongbo Liu, Jason Liu and Andy Ogielski  
*1999 Int'l Conference on Parallel and Distributed Processing Techniques and Applications*  
Las Vegas, June 1999
- C57. Modeling 100,000 Nodes and Beyond: Self-Validating and Design  
Andrew Ogielski, James Cowie and David Nicol  
*DARPA/NIST and Workshop on and Validation of Large-Scale Network and Simulation Models*  
Reston, VA, May 1999
- C58. Fluid-based Simulation of Communication Networks using SSF  
David Nicol, Michael Goldsby and Michael Johnson  
*1999 SCS European Simulation Conference*  
Erlangen, Germany, October 1999
- C59. Performance Prediction of a Parallel Simulator  
Jason Liu, David Nicol, Brian Premore and Anna Poplawski  
*1999 Workshop on Parallel and Distributed Simulation (PADS)*  
Atlanta, GA., May 1999, pp. 156-164
- C60. **Nops**: A Conservative Simulation Engine for TeD  
Anna Poplawski and David Nicol  
*1998 Workshop on Parallel and Distributed Simulation*  
Banff, CA, June 1998, pp. 180-187
- C61. Rapid Simulation of Wireless Systems  
Felipe Perrone and David Nicol  
*1998 Workshop on Parallel and Distributed Simulation*  
Banff, Canada, June 1998, pp. 170-177
- C62. Scalability, Locality, Partitioning, and Synchronization  
David Nicol  
*1998 Workshop on Parallel and Distributed Simulation*  
Banff, Canada, June 1998, pp. 4-11
- C63. IDES: A Java-based Distributed Simulation Engine  
David Nicol, Michael Johnson and Ann Yoshimura  
*1998 International Workshop on Modeling Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS)*  
Montreal, Canada 1998, pp. 233-240
- C64. Multiprocessor Out-of-Core FFTs with Distributed Memory and Parallel Disks  
Tom Cormen, David Nicol and Jake Wegmann  
*1997 Workshop on Parallel IO*  
November 1997, pp. 68-78
- C65. Discrete-Event Simulation of Fluid Stochastic Petri Nets  
Gianfranco Ciardo, David Nicol and Kishor Trivedi  
*1997 Petri Nets and Performance Modeling Symposium*  
1997, pp. 217-225
- C66. Modeling TCP with the TeD Parallel Simulation Language  
Brian Premore and David Nicol  
*1997 Winter Simulation Conference*  
Atlanta, GA, December 1997, pp. 437-443

- C67. The IDES Framework: A case study in Development of a Parallel Simulation System  
David Nicol, Michael Johnson and Anne Yoshimura  
*1997 Winter Simulation Conference*  
Atlanta, GA, December 1997, pp. 93-99
- C68. The Dark Side of Risk (what your mother never told you about Time Warp)  
David Nicol and Jason Liu  
*1997 Workshop on Parallel and Distributed Simulation*  
Lockenhaus, Austria, May 1997, pp. 188-195
- C69. Performance Modeling of the IDES Framework  
David Nicol, M. Johnson, M. Goldsby and A. Yoshimura  
*1997 Workshop on Parallel and Distributed Simulation*  
Lockenhaus, Austria, June 1997, pp. 38-45
- C70. Principles of Conservative Parallel Simulation  
David Nicol  
*1996 Winter Simulation Conference*  
Coronado, CA, December 1996, pp. 128-135
- C71. Parallel Multidisciplinary Design Optimization  
Weizhen Mao and David Nicol  
*8<sup>th</sup> IASTED-ISMM International Conference on Parallel and Distributed Computing and Systems*  
1996, pp. 91-93
- C72. Experiments in Automated Load Balancing of Parallel Simulation  
Linda Wilson and David Nicol  
*1996 Workshop on Parallel and Distributed Simulation*  
Philadelphia, PA, May 1996, pp. 4-11
- C73. On Extending More Parallelism to Serial Simulators  
Philip Heidelberger and David Nicol  
*1996 Workshop on Parallel and Distributed Simulation*  
Philadelphia, PA, May 1996, pp. 202-206
- C74. Parallelizable Execution-Driven Simulation of Threaded Distributed Memory Parallel Computations  
David Nicol and Jason Liu  
*1996 MASCOTS Conference*  
San Jose, CA 1996, pp. 174-178
- C75. Building Parallel Simulations from Serial Simulators  
Philip Heidelberger and David Nicol  
*1996 MASCOTS Conference*  
Santa Barbara, CA 1996, pp. 2-4
- C76. Combinatorics of  $k$ -ary  $n$ -cubes with Applications to Partitioning  
Weizhen Mao and David Nicol  
*Proceedings fo the 4<sup>th</sup> International Conference for Young Computer Scientists*  
Beijing, Peoples Republic of China 1995, pp. 662-669
- C77. A Heuristic for Partitioning Parallel Computations  
Weizhen Mao and David Nicol  
*7<sup>th</sup> IASTED International Conference on Parallel and Distributed Computing and Systems*  
Washington, D.C. 1995, pp. 295-297

- C78. Automated Load Balancing in SPEEDES  
Linda Wilson and David Nicol  
*1995 Winter Simulation Conference*  
Washington, D.C., December 1995, pp. 590-596
- C79. Towards A Thread-Based Parallel Direct Execution Simulator  
Phillip Dickens, David Nicol, Matthew Haines and Piyush Mehotra  
*29<sup>th</sup> Hawaii Int'l Conf. of System Science*  
1995
- C80. Case Study: Safety Analysis of the NASA/Boeing Fly-By-Light Airplane Using a New Reliability Tool  
Mike Ulrey, David Nicol and Dan Palumbo  
*1996 Reliability Availability and Maintainability Symposium*  
January 1996
- C81. On Extending Parallelism to Serial Simulations  
David Nicol and Philip Heidelberger  
*1995 Workshop on Parallel and Distributed Simulation*  
Lake Placid, NY, June 1995, pp. 60-67
- C82. Empirical Study of Parallel Trace-Driven Cache Simulators  
David Nicol and Eric Carr  
*1995 Workshop on Parallel and Distributed Simulation*  
Lake Placid, NY, June 1995, pp. 166-169
- C83. Global Virtual Time and Distributed Synchronization  
Jeff Steinman, David Nicol, Craig Lee and Linda Wilson  
*1995 Workshop on Parallel and Distributed Simulation*  
Lake Placid, NY, June 1995, pp. 139-148
- C84. Parallelized Network Simulators for Message-Passing Parallel Programs  
Phillip Dickens, David Nicol and Philip Heidelberger  
*1995 MASCOTS Conference*  
January 1995, pp. 18-20
- C85. Timing Simulation of Paragon Codes Using Workstation Clusters  
Phillip Dickens, Philip Heidelberger and David Nicol  
*1994 Winter Simulation Conference*  
Orlando, FL, December 1994, pp. 1347-1353
- C86. A Graphical Tool for Reliability and Failure-Mode-Effects Analysis  
David Nicol, Dan Palumbo and Mike Ulrey  
*1995 Reliability and Maintainability Symposium*  
1995, pp. 74-81
- C87. Optimal Multiphase Complete Exchange on Circuit-Switched Hypercube Architectures  
David Nicol and Shahid Bokhari  
*1994 ACM SIGMETRICS Conference*  
Nashville, TN, May 1994, pp. 252-260
- C88. A Distributed Memory LAPSE:Parallel Simulation of Message-Passing Programs  
Phillip Dickens, David Nicol and Philip Heidelberger  
*1994 Workshop on Parallel and Distributed Simulation*  
Edinburgh, Scotland, July 1994, pp. 32-38
- C89. Efficient Massively Parallel Simulation of Dynamic Channel Assignment Schemes for Wireless Cellular Communications  
Albert Greenberg, David Nicol, Boris Lubachevsky and Paul Wright  
*1994 Workshop on Parallel and Distributed Simulation*  
Edinburgh, Scotland, July 1994, pp. 187-194

- C90. The Impact of Adding Aggressiveness to a Non-Aggressive Windowing Protocol  
Phillip Dickens, David Nicol, Paul Reynolds, Jr. and Mark Duva  
*1993 Winter Simulation Conference*  
San Diego, CA, December 1993, pp. 731-739
- C91. Parallel Simulation of Markovian Queueing Networks Using Adaptive Uniformization  
David Nicol and Philip Heidelberger  
*1993 ACM SIGMETRICS Conference*  
Santa Clara, CA, May 1993, pp. 135-145
- C92. Parallel Algorithms for Simulating Continuous Time Markov Chains  
David Nicol and Philip Heidelberger  
*1993 Workshop on Parallel and Distributed Simulation*  
San Diego, CA, May 1993, pp. 11-18
- C93. Optimistic Global Synchronization for Parallel Discrete-Event Simulations  
David Nicol  
*1993 Workshop on Parallel and Distributed Simulation*  
San Diego, CA, May 1993, pp. 27-34
- C94. REST: A Parallelized Reliability Estimation System  
David Nicol, Adam Rifkin and Dan Palumbo  
*1993 Reliability and Maintainability Symposium*  
Atlanta, GA, January 1993, pp. 436-442
- C95. Load Balancing Using Stochastic Majorization  
David Nicol, Rahul Simha and Don Towsley  
*1993 INFOCOMM*  
1993, pp. 1306-1313
- C96. MIMD Parallel Simulation of Circuit Switched Communication Networks  
David Nicol, Albert Greenberg and Boris Lubachevsky  
*1992 Winter Simulation Conference*  
Arlington, VA, December 1992, pp. 629-636
- C97. State of the Art in Parallel Simulation  
Richard Fujimoto and David Nicol  
*1992 Winter Simulation Conference*  
Arlington, VA, December 1992, pp. 246-254
- C98. Communication Efficient Global Load Balancing  
David Nicol  
*1992 Scalable High Performance Computing Conference*  
Williamsburg, VA 1992, pp. 292-299
- C99. Massively Parallel Algorithms for Trace-Driven Cache Simulations  
David Nicol, Albert Greenberg and Boris Lubachevsky  
*1992 Workshop on Parallel and Distributed Simulation*  
Newport Beach, CA 1992, pp. 3-11
- C100. Simultaneous Parallel Simulations of Continuous Time Markov Chains at Multiple Parameter Settings  
Philip Heidelberger and David Nicol  
*1991 Winter Simulation Conference*  
Phoenix, AZ, December 1991, pp. 602-607
- C101. Parallel Simulation of Timed Petri-Nets  
David Nicol and Subhas Roy  
*1991 Winter Simulation Conference*  
Phoenix, AZ, December 1991, pp. 574-583

- C102. A Conservative Approach to the Parallelization of the Sharks World Simulation  
David Nicol and Scott Riffe  
*1990 Winter Simulation Conference*  
New Orleans, LA, December 1990, pp. 186-190
- C103. Generation and Analysis of Large Reliability Models  
Dan Palumbo and David Nicol  
*Proceedings of IEEE/AIAA Ninth Digital Avionics Systems Conference*  
Virginia Beach, VA 1990, pp. 350-354
- C104. Performance Analysis of Massively Parallel Discrete-Event Simulations  
David Nicol  
*SIGPLAN Symposium on the Practice and Principles of Parallel Programming*  
Seattle, WA, March 1990
- C105. Efficient Aggregation of Multiple LPs in Distributed Memory Parallel Simulations  
David Nicol, Chris Micheal and Patrick Inouye  
*1989 Winter Simulation Conference*  
Washington, D.C., December 1989, pp. 680-685
- C106. Scattered Decomposition and the Partitioning of Loops and Domains  
Joel Saltz, David Nicol and Harry Berryman  
*1989 SIAM Conference on Parallel Processing for Scientific Computing*  
1989
- C107. Accurate Modeling of Parallel Scientific Computations  
David Nicol and James Townsend  
*1989 ACM SIGMETRICS Conference*  
Berkeley, CA, May 1989, pp. 165-170
- C108. High Performance Parallelized Discrete Event Simulation of a Stochastic Queueing Network  
David Nicol  
*1988 Winter Simulation Conference*  
San Diego, CA, December 1988, pp. 306-314
- C109. The Implementation of a Parallelized Simulation of Queueing Networks using Fortran and Abstract Data Types  
Keith Miller and David Nicol  
*1988 Winter Simulation Conference*  
San Diego, CA, December 1988, pp. 333-338
- C110. Parallel Discrete-Event Simulation of Stochastic Queueing Networks  
David Nicol, proceedings of and the  
*ACM SIGPLAN Conference on Parallel Programming*  
New Haven, CT, July 1988, pp. 124-137
- C111. Principles of Runtime Support for Parallel Processors  
Ravi Mirchandaney, Joel Saltz, Roger Smith and Kay Crowley and David Nicol  
*1988 International Conference on Supercomputing*  
Saint Malo, France , July 1988, pp. 140-152
- C112. Methods for Automated Problem Mapping  
Joel Saltz, David Nicol, Ravi Mirchandaney, Roger Smith and Kay Crowley  
*Proceedings IMACS 1988 12th World Congress on Scientific Computation*  
1988
- C113. The PARTY Parallel Runtime System  
Joel Saltz, Ravi Mirchandaney, Roger Smith and Kay Crowley and David Nicol  
*SIAM Conference on Parallel Processing for Scientific Computation*  
Los Angeles, CA 1987, pp. 335-345

- C114. Performance Issues for Distributed Battlefield Simulations  
David Nicol  
*1987 Winter Simulation Conference*  
Atlanta, GA, December 1987, pp. 624-628
- C115. Problem Size, Parallel Architecture, and Optimal Speedup  
David Nicol and Frank Willard  
*1987 International Conference on Parallel Processing*  
St. Charles, IL, August 1987, pp. 347-354
- C116. An Optimal Repartitioning Decision Policy  
David Nicol and Paul Reynolds  
*1985 Winter Simulation Conference*  
San Francisco, CA, December 1985, pp. 493-497
- C117. Problem Oriented Protocol Design  
David Nicol and Paul Reynolds  
*1984 Winter Simulation Conference*  
Dallas, TX, December 1984, pp. 471-474

BOOK CHAPTERS

- BC1. Applying Trusted Network Technology to Industrial Control Networks  
H. Okhravi and D. M. Nicol  
b  
Critical Infrastructure Protection  
Springer  
2008
- BC2. Securing Current and Future Process Control Systems  
R. Cunningham, S. Cheung, M. Fong, U. Lindquist, D. Nicol, R. Pawlowski, E. Robinson,  
W. Sanders, S. Singh, A. Vades, B. Woodward and M. Zhivich  
*Critical Infrastructure Protection*  
Springer  
2007, pp. 99-116
- BC3. Problem Characteristics and Parallel Simulation  
David Nicol  
*Parallel Computing : Paradigms and Applications*  
International Thomson Computer Press  
1995, pp. 498-513
- BC4. Dynamic Remapping of Time-stepped Parallel Simulations  
David Nicol  
*Distributed Simulation 1989*  
SCS Simulation Series  
1989, pp. 121-125
- BC5. Parallel Evaluation of a Dynamic Programming Equation Using Optimistic Evaluation  
David Nicol  
*Impacts of Recent Computer Advances on Operations Research*  
North-Holland  
1989, pp. 120-130
- BC6. Mapping a Battlefield Simulation onto Message-Passing Parallel Architectures  
David Nicol  
*Distributed Simulation 1988*  
SCS Simulation Series  
1988, pp. 141-146

- BC7. Statistical Methodologies for the Control of Dynamic Remapping  
Joel Saltz and David Nicol  
*Parallel Processing and Medium Scale Multiprocessors*  
SIAM Publications, Philadelphia, PA  
1989, pp. 35-57
- BC8. A Statistical Approach to Dynamic Partitioning  
David Nicol and Paul Reynolds  
*Distributed Simulation 1985*  
SCS Simulation Series  
1985, pp. 53-56

## Public Domain Software

I have over the years developed several pieces of software which I have placed in the public domain.

1. DaSSF  
The Dartmouth implementation of the Scalable Simulation Framework. A high performance parallel simulation kernel with C++ API, highly portable. It is in active use in DoE laboratories, industry (e.g. Motorola), and academic research projects. It is most commonly used to model communication and computer systems.
2. SSFNet  
SSFNet is a public domain body of software for the modeling and simulation of computer systems, using the SSF Java API. My research team has contributed significantly to the software at this site.
3. WIMPE  
In 1996, in conjunction with my role as Program Chair of the ACM Sigmetrics conference I developed what I believe was the first web-based system for paper submission and reviewing management. I parameterized this system to be configurable for other conferences, called it Web Interface for Managing Programs Electronically (WIMPE), and made it available for use by others. In its 6<sup>th</sup> revision now, at any given time there are half a dozen conferences using it.
4. RITE  
The Reliability Interface Tool Extension (RITE) is a program written to support path-based analysis of complex hardware systems. It is designed to be integrated with a system design tool such as BoNES Designer and ADEPT (it has been integrated with both of these). RITE provides a master-slave interface to the system modeling tool, where RITE is master. It queries the system modeling tool for information about the model, information that allows RITE to construct path-based Markovian analysis of the probability of failure.
5. NON-COMMITAL SYNCHRONIZATION BARRIER  
This is code that implements an algorithm I developed of a barrier synchronization, with the twist that a process can change its mind and back out of the barrier in response to receipt of a new message. It is tricky coding, and so I make available source code that is parameterized to work with different message passing libraries. While developed in the early 1990's, this code still gets a few downloads a month by sources other than bots.

## Selected Invited Talks

### KEYNOTE ADDRESSES

- 2009: *Melding Power Devices, Electrical Simulation, and Computer Simulation (A Testbed for Power System Security Evaluation)*, SIMUTools'09 (2<sup>nd</sup> International Conference on Simulation Tools and Techniques).
- 2005: *Models and Analysis of Active Worm Defense*, International Workshop on Mathematical Methods, Models and Architectures for Computer Networks Security, St. Petersburg, Russia.
- 2003: *Multiscale Modeling and Simulation of Worm Effects on the Internet Routing Infrastructure*, Performance Tools 2003 Conference, Urbana, IL.
- 2003: *Network Security Research using High Performance Simulation*, 7<sup>th</sup> Workshop on Distributed Supercomputing (SOS7), Durango, CO.
- 1999: *Simulation : The 3<sup>rd</sup> Leg of Science*, CESDIS Workshop on Simulation, NASA Goddard Research Center, Greenbelt, MD.
- 1997: *Parallel Simulation : So Who Cares?*, 1997 Conference on Parallel and Distributed Simulation. Lockenhaus, Austria.
- 1997: *Parallel Simulation : Past, Present, Future*, Annual Simulation Symposium, Atlanta, GA.

### SELECTED INVITED PRESENTATIONS

- 2001 : *Discrete Event Fluid Modeling of TCP*, University of California, San Diego; Information Sciences Institute.
- 2001 : *Composite Synchronization for Parallel Discrete-Event Simulation*, Rensselaer Polytechnical Institute.
- 2000 : *Fluid Modeling of TCP*, Oxford University; University of Vienna.
- 1999 : *Scalable Modeling and Analysis of Communication Networks*, Univ. of Maryland.
- 1998 : *DaSSF: A High Performance Parallel Network Simulator*, Royal Institute of Technology, Stockholm, Sweden.
- 1996 : *High Performance Tools for Simulating Complex Discrete Systems*, IBM TJ Watson Research Center, ATT Labs.
- 1994 : *Massively Parallel Simulation of Communication Networks*, University of Minnesota; University of Wisconsin.
- 1994 : *A Distributed Memory LAPSE: Parallel Simulation of Message-Passing Programs*, University of Maryland; University of Illinois Champagne-Urbana; University of Arizona, MITRE Corporation.
- 1993 : *Massively Parallel Discrete-Event Simulation*, Royal Institute of Technology, Stockholm, Sweden.
- 1992 : *Parallel Simulation of Circuit-Switch Communication Networks*, AT&T Bell Labs.
- 1991 : *Parallel Simulation of Continuous Time Markov Chains Using Uniformization*, McGill University; Duke University.
- 1990 : *Performance Analysis of Parallelized Discrete-Event Simulation*, AT&T Bell Labs; IBM TJ Watson Research Center.
- 1989 : *Parallelized Estimation of Network Reliability*, Carnegie-Mellon University.
- 1989 : *The Cost of Conservative Synchronization in Parallel Discrete-Event Simulations*, Stanford University; University of California, Berkeley.
- 1988 : *The Optimal Mapping of Pipelined Computations onto Linear Arrays*, General Electric Research and Development Center.
- 1987 : *Static Mapping of Irregular Problems*, Yale University.
- 1987 : *Optimal Dynamic Remapping Policies*, IBM TJ Watson Research Center.

## Professional Activities

### EDITORIAL ACTIVITIES

**Associate Editor**, *Performance Evaluation*, 2005-present.

**Editor-in-Chief**, *ACM Transactions on Computer Modeling and Simulation*, 1997-2003.

**Area Editor**, *ACM Transactions on Computer Modeling and Simulation*, 1996-1997.

**Associate Editor**, *ACM Transactions on Computer Modeling and Simulation*, 1990-1996.

**Associate Editor**, *ORSA Journal on Computing*, 1990-1997.

### ADVISORY ACTIVITIES

**Steering Committee**, Workshop on Principles of Advanced and Distributed Simulation, 2005-present.

**Science Council**, Center of Excellence in Space Data and Information Science, 1995-1999, Chair 1998-1999.

**CMG Computer Science Advisory Committee**, 1994-1995, Chair 1995.

**Executive Committee**, Virginia/ICASE/Langley Program in High Performance Computing and Communication, 1995-1996.

**Steering Committee**, Workshop on Parallel and Distributed Simulation, 1992-1994.

### CONFERENCE ORGANIZATION

**General Chair**, Winter Simulation Conference 2006.

**General Chair**, Workshop on Principles of Advanced and Distributed Simulation, 2005.

**Program Chair**, 2001 MASCOTS conference.

**Program Chair**, 1996 ACM Sigmetrics Conference.

**Tools Chair**, 1995 Petri Net and Performance Modeling Conference.

**Tutorial Chair**, 1994 ACM Sigmetrics Conference.

**Publicity/Exhibits Chair**, 1992 ORSA Conference on the Interface of Operations Research and Computer Science.

**General Chair**, 1990 Workshop on Parallel and Distributed Simulation.

**Program Chair**, 1989 Workshop on Parallel and Distributed

**Program Committee**, PADS (1992-2002), Winter Simulation Conference (1989, 1991), ACM Sigmetrics (1991-1993, 1998-1999, 2002), MASCOTS (2002), Communication Networks and Distributed Systems Modeling Conference (2002), International Performance, Computing and Communications Conference (2002). There are surely others. I've lost count.

### PROFESSIONAL MEMBERSHIPS

IEEE, Fellow.

ACM, Fellow.

INFORMS, member.

IFIPS Working Group 7.3 (for performance evaluation).