

Boleslaw K. Szymanski, Rensselaer Polytechnic Institute
Claire and Roland Schmitt Distinguished Professor of Computer Science
Director, Center for Pervasive Computing and Networking
IEEE Fellow; Editor-in-Chief: *Scientific Programming*

Education

M.Sc. (Electronics) – Faculty of Electronics and Information Technology,
the Warsaw University of Technology, Warsaw, Poland, 1973
Ph.D. (Computer Science) – The Institute of Computer Science,
the Polish Academy of Sciences, Warsaw, Poland, 1976

Professional Career

Warsaw University of Technology, Warsaw, Poland
1973-1975 Assistant Professor
Institute of Scientific, Technical, and Economic Information, Warsaw, Poland
1976-1978 Researcher
1979, Fall Postdoctoral Researcher at University of Aberdeen, UK
1979-1982 Head of Information System Division
University of Pennsylvania, Philadelphia, PA
1982-1985 Visiting Assistant Professor, Computer and Information Science
Rensselaer Polytechnic Institute, Troy, NY
1985-1989 Associate Professor of Computer Science
1993-1994 Acting Department Chair, Department of Computer Science
1997-2001 Associate Dean for Information Technology
1997-2002 Chair of Information Technology Research Board
1990-2007 Professor of Computer Science
2003-present Founding Director, Center for Pervasive Computing and Networking
2007-present Claire and Roland Schmitt Distinguished Professor

Entrepreneurship and Industrial Consulting

Optimaret, Inc., Newtonville, NY (2004), co-founder and President,
Premonitia, Inc., Waltham, MA (2001), and EnterNet Inc., Troy, NY (2000), co-founder,
CCCC, Philadelphia, PA (1983-88), chief scientific officer and consultant.
Consulting: Gauda, Inc., San Jose, CA; Emerson, Inc., St. Louis, MO; International Medical Programs,
Albany, NY; Cardiomag Imaging, Schenectady, NY; IBM Corp., Poughkeepsie, NY; Research and
Development Center, General Electric, Schenectady, NY; United Nation Development Office,
Vienna, Austria.

Professional Society Memberships, Honors, Awards and Activities

Appointed the Claire and Roland Schmitt Distinguished Professor, RPI, 2007
William H. Wiley Distinguished Faculty Award, RPI, 2003
IEEE Fellow (since 1999), Computer Society of IEEE: member since 1982
ACM National Lecturer(1988-89), Association for Computing Machinery: member since 1982

Editor-in-Chief: *Scientific Programming* (since 2000)
Area Editor: *SIMULATION: Transactions of The Society for Modeling & Simulation International* (2003-2007)
Member of the Editorial Board: *Scalable Computing: Practices & Experience* (since 2005)

Guest Editor: *ACM SIGAPP Applied Computing Review* (1996),
Journal of Parallel Algorithms and Applications (1996), *Scientific Programming* (1996, 1998)
Member of the Editorial Board: *Parallel and Distributed Computing Practices* (1999-2004)

First Prize in SuCuPar93, international parallel computation competition, Mannheim, Germany, 1993
NASA Certificate of Recognition for development of technical innovation, 1997
Gold Medal at the International Olympiad in Mathematics, 1968

Chair, The Third Workshop on Compilers, Languages and Run-Time Systems, Troy, NY, May, 1995
Co-Chair, Program Committee, 1st Annual Conference of Information Technology Alliance,
Washington, DC, September 2007

Vice-Chair, NSF-RPI Workshop on Pervasive Computing and Networking, Troy, NY, April 2004
Vice-Chair of Program Committee, PPAM05, PPAM07, since 2005

Chair, Network Simulation Track, European Modeling and Simulation Symp., Barcelona, Spain, 2006
General Co-Chair, Auctions, Market Mechanisms and their Applications Conference, Boston, MA, May 2009
Tutorials: SCSC'02, IEEE ICA3PP'96, ACM SAC'96, ISC'88

Senior Scientific Advisor to Create-Net, European Research Consortium in Trento, Italy since January 2005.
Scientific Advisor to Gauda Inc, since June 2006
A member of the Working Group of EU Ubiquitous Data Mining Initiative, April 2006
Scientific Advisor to Quantum-PI Inc, since August 2007

Research Interests

Sensor network, mobile networks, and network management and simulation, including the Internet, network middleware and Web-based computing. Scientific parallel computation, in particular run-time optimization, load balancing and monitoring of parallel and distributed object-oriented programs. Algorithm design and verification for parallel and distributed systems.

Administrative Experience

Founding Director the Center for Pervasive Computing and Networking (since 2003): developed the vision of the center and assembled about 25 faculty research team participating in the center research with focus on sensor networks, computer networking, embedded system software and computer security. Developed and implemented research program supported that this year received over 6 mln dollars in government grants and ushered the Center into the International Technology Alliance, a quarter of a billion dollar research consortium led by the IBM Corp.

Associate Dean for Information Technology (1997-2001): principal member of the team that created the Information Technology Program at RPI and developed IT curriculum; chair of Computer Science department faculty search that hired eleven assistant professors from top schools since 1997, six of whom already won prestigious NSF Career's Awards; chair of the "Future of School of Science" panel and principal author of a report that identified Information Technology and Biotechnology as strategic directions for the school in 1999 (these two directions were later selected as growth initiatives for the entire university); currently leading an integration of research in Information Technology involving Schools of Engineering, Science and Humanities & Social Science.

Chair of the Information Technology Research Board:(1997-2002) advisor to the Vice-President for Research and the Vice-Provost for Information Technology on strategic directions of IT research for university.

Founding Member of Scientific Computing Research Center (SCOREC) (since 1988) that focuses on adaptive solvers for partial differential equations and multiscale and multiphase simulations.

Co-author and co-Principal Investigator in major SCOREC grants.

Research Grants

1. *Equipment for Parallel Scientific Computation*, U.S. Army Research Office and Air Force Office of Scientific Research, \$141,000, co-PI, September 1987.
2. *Parallel Scientific Computation*, U.S. Army Research Office, \$759,000, co-PI, June 1986 to May 1989.
3. *Solution of Partial Differential Equations on Parallel Computers Using an Equational Language*, National Science Foundation, \$92,751, co-PI, August 1987 - January 1990.
4. *Development of a Definitional Language Processor for Real-Time Applications*, Office of Naval Research, \$266,480, sole PI, July 1986 - September 1990.
5. *Parallel Scientific Computation*, Army Research Office, \$60,000, co-PI, May 1990 - April 1991.
6. *Research Experience in Computer Science for Undergraduates*, National Science Foundation, \$120,860, co-PI, June 1989 - May 1992.
7. *Adaptive Solutions of Partial Differential Equations on Parallel Computers Using an Equational Language*, National Science Foundation, \$64,000, co-PI, April 1990 - September 1992.
8. *Computing Environments for Mathematical Applications*, National Science Foundation CISE, \$2,015,105, co-PI, October 1988 - September 1993.
9. *Travel Grant*, National Science Foundation, \$1,000, 1990.
10. *IBM Faculty Development Grant*, IBM Corp, \$75,000, sole PI, July 1992 - June 1995.
11. *Software Tools for Adaptive Parallel Computation*, Office of Naval Research, \$221,451, sole PI, December 1992 - January 1996.
12. *Programming Paradigms in Run-Time Support of Parallelism for Irregular Computations*, NASA GRFP, \$66,000, sole PI, July 1993 - June 1996.
13. *Acquisition of HP 9000 workstation with C++ and Fortran90 compilers*, Hewlett-Packard, \$24,375, sole PI, June 1996.
14. *Domain Specific Parallel Adaptive Scientific Computations*, National Science Foundation, \$134,7000, co-PI, July 1993 - June 1997.
15. *Travel Grant*, National Science Foundation, \$1,000, 1994.
16. *Parallel Software Tools for Spatial Modeling of Ecological Systems*, National Science Foundation, \$168,000, sole PI, July 1994 to June 1997.
17. *Acquisition of Instrumentation to Facilitate Large Scale Parallel Computation*, NSF Instrumentation Grant, \$100,000, co-PI,
18. *Mobile Agents in Distributed Computing*, IBM Shared University Research, \$25,000, sole PI, February 1998 - December 1999.
19. *Proactive Problem Avoidance and QoS Guarantees for Large Heterogeneous Networks*, subcontract to Lucent Technology grant from DARPA BAA9704, \$500,000, co-PI, October 1997 - September 2000.

20. *Network Management and Control Using Collaborative On-Line Simulation*, DARPA BAA9802, \$617,000, co-PI, August 1998 - May 2000.
21. *Understanding Human Joint Mechanics through Advanced Computational Models*, National Science Foundation HPCC, \$2,518,000, co-PI, September 1993 - August 2000.
22. *Equipment for Distributed Network Laboratory*, IBM Corp., Shared University Research, \$167,000, PI, October 2000.
23. *Agent-based Middleware for Network Management*, IBM Corp., Shared University Research, \$25,000, sole PI, January 1999 - December 2000.
24. *A High-Performance Problem-Solving Environment for Optimization and Control of Chemical and Biological Processes*, NSF (subcontract with University of Minnesota), \$1,649,999, co-PI, October 1995 - May 1997.
25. *A High-Performance Problem-Solving Environment for Optimization and Control of Chemical and Biological Processes*, NSF (subcontract with University of California, Santa Barbara), \$1,448,247, co-PI, June 1997 - May 2001.
26. *Scalable Instrumentation and Database Approach to Performance Analysis of Parallel Scientific Applications*, NASA GRFP, \$44,000, sole PI, July 1999- June 2001.
27. *Mapping Results of Continuous Simulations onto Spatially Explicit Parallel Distributed Event Simulations*, NSF KDI (subcontract with Dartmouth College), \$1,400,000, co-PI, July 1998 - September 2003.
28. *Metacomputing: Nomadic and Parallel Computation Over the Internet*, IBM Corp., Shared University Research, \$25,000, sole PI, January 2000 - December 2001.
29. *Scalable Online Network Modeling and Simulation*, DARPA BAA0018, \$1,515,761, PI, June 2000 - January 2005.
30. *Scalable Network Performance Modeling and Prediction for Network Management*, CISCO URP Grant, \$123,000, sole PI, June 2001 - July 2003.
31. *Performance Mining of Large-Scale Data-Intensive Distributed Object Applications*, NSF NGS Program, \$1,342,361, co-PI, September 2001 - August 2005.
32. *Techniques for Resource Discovery, Monitoring and Allocation in SmartGrids*, IBM Corp. \$33,000, sole PI, November 2002- February 2004.
33. *Automatic Classification of Magnetocardiograms*, NSF SBIR Phase I, \$90,518, Senior Investigator with Karsten Sternickel of Cardiomag Imaging Inc., January - June 2003.
34. *Automatic Classification of Magnetocardiograms*, NSF SBIR Phase II, \$486,749, Senior Investigator with Mark Embrechts and Karsten Sternickel of Cardiomag Imaging Inc., February 2004 - August 2006.
35. *Simulation and Analysis of Large Scale Complex Systems*, NSF CISE Research Infrastructure, \$155,969, co-PI, August 2003 - July 2007.
36. *CLEANER: Collaborative Research: Riverscope: Large Scale Engineering Analysis Network For Environmental Research on the Hudson River*, NSF, \$42,500, co-PI with Arthur Sanderson, August 2004 - July 2007.

Current Grants

37. *US-EC Cooperative Activities: Interactive Service Negotiation and Adaptive Delivery Platform for IP-Based Communications*, NSF INT Program, \$24,800, sole PI, September 2004 - August 2008.
38. *Uncovering Hidden Groups that Support IED Activities*, ONR BAA-05-024, \$884,060, PI, March 2006 - March 2009.
39. *International Technology Alliance*, \$850,000 plus \$1,000,000 option, IBM Titians consortium funded by ARL, sole PI, May 2006 - March 2011.
40. *Astroinformatics: Data-Driven Discovery of the Milky Way Origin and Evolution from the Sloan Digital Sky Survey*, NSF, \$799,700, co-PI, August 2006 - July, 2009.
41. *Development of a Database System for Metamorphic Geochemistry*, NSF, \$712,688, co-PI, August 2006 - August 2009.

Ph.D. Graduates

- Jeanette Bruno: “Analyzing Conditional Data Dependencies in an Equational Language Compiler,” 1989; the McNaughton Award for the best CS graduate student (1989);
Researcher, Corporate Research and Development Center, GE, Schenectady, NY.
- Balaram Sinharoy: “Optimizing Iterative Algorithms for Distributed-Memory Machines,” 1992; the McNaughton Award for the best CS graduate student (1992);
Senior Researcher, Future Directions Division, IBM Corp., Poughkeepsie, NY.
- Can Ozturan: “Distributed Environment and Load Balancing for Adaptive Unstructured Meshes,” 1995 (co-advisor with J. Flaherty); Assistant Professor, Bogazici University, Istanbul, Turkey.
- Charles Norton: “Object Oriented Paradigms in Scientific Computing,” 1996;
Senior Scientist, Jet Propulsion Laboratory, NASA, Pasadena, CA.
- Ewa Deelman: “Performance Optimization of Parallel Discrete Event Simulation of Spatially Explicit Problems,” 1997; Researcher, University of California, Los Angeles, CA.
- Wesley Kaplow: “Compile-Time and Run-Time Methods for Cache Optimization in Scientific Codes,” 1998; Senior Technology Director, Qwest Communications, Whippany, NJ.
- Mohan Nibhanapudi: “Adaptive Parallel Computations on Network of Workstations,” 1998;
Researcher, Inktomi, Inc., currently Yahoo
- William Maniatty: “High-Performance Computing Ecological Modeling,” 1998;
the Gerhardt Prize for the outstanding graduate student in Science and Engineering (1997);
the McNaughton Award for the best CS graduate student (1998);
Assistant Professor, SUNY Albany.
- Jeffrey Nesheiwat: “Instrumentation Data Base Approach to the Analysis of Large Parallel and Object Oriented Scientific Applications,” 2000; Researcher, Oracle, Inc.
- Gang Chen: “New Methods for Parallel Discrete Event Simulation,” 2003;
the McNaughton Award for the best CS graduate student (2003); researcher, MathWorks, Boston, MA.
- Alan Bivens: “Distributed Framework for Deploying Machine Learning in Network Management and Security,” 2003; Researcher, IBM TJ Watson Laboratory, Poughkeepsie, NY.
- Yu Liu: “Loosely-Coordinated, Distributed, Packet-Level Network Simulation,” 2004;
Software Engineer, SyncSort Incorporated, NJ.
- Houda Lamahmedi: “Decentralized Data Management Framework for Data Grid,” 2005,
researcher, Oracle, Inc., Portland, OR;
- Bouchar Bouqata: “VOGUE: A Novel Variable Order-Gap State Machine for Modeling Sequences,” 2006,
researcher, GE Research and Development Center, Schenectady, NY;
- Paul Evangelista: “The Unbalanced Classification Problem: Detecting Breaches In Security,” 2006,

analyst, US Military Academy, West Point, NY;

Joel Branch: “Opportunistic Routing and Middleware Composition for Sensor and Actuator Networks,” 2007, the McNaughton Award for the best CS graduate student (2007); researcher, IBM TJ Watson Laboratory, Hawthorne, NY.

Juong-Sik Lee: “Recurrent Auctions in E-Commerce,” 2007, researcher, Nokia Research Center, Palo Alto, CA.

Supervised 65 M.S. theses. Member of 51 Ph.D. committees at RPI, University of Pennsylvania; Temple University; Technical University of Nova Scotia, Canada; Gerona University, Spain; Cape Town, South Africa.

Strong commitment to diversity resulted in development of a methodology of involving students from underrepresented minorities in research. For example among 17 graduated or schedule to graduate by the end of semester Ph.D. students there are five woman and three African American students as well as one student with physical disability.

Teaching Experience

- Graduate courses: Computer Operating Systems, Theoretical Issues in Operating System Design, Parallel Programming Languages, Theory of Compiler Design.
- Undergraduate courses: Parallel Programming, Operating Systems, Operating System Fundamentals, Compiler Design, Programming Languages, Discrete Structures, Fundamentals of Computer Science.
- Several graduate and undergraduate special topics courses in networking, distributed and parallel computing.

University Service

- Director of the Center for Pervasive Computing and Networking (since 2003)
- Associate Dean for Information Technology (1997 - 2001)
- Chair of Information Technology Research Board (1997 - 2002)
- member of Faculty Council (1989-1991), Faculty Compensation Committee (1991-93), and Faculty Planning Committee (2003-2006);
- chair of departmental committees on: Graduate Curriculum in Operating Systems, Enrollment Committee, Search Committee, Best Teacher Award, Ph.D. Preliminary Exam, Planning Committee, Chair Search Committee, Graduate Curriculum;
- member of departmental committees: New Staff, Graduate Curriculum, Laboratory, Planning Committee;

Patents

1. *Discrete event simulation system and method*, granted 07/17/2007, US Patent Number 7,246,054 (with Gang Chen).
2. *Network Management and Control using Collaborative On-Line Simulation*, granted 4/22/2008 US patent number 7,363,285 (with S. Kalyanaraman, K. Vastola, N. Sikdar, J. Jiang, Y. Tao, D. Harrison, B. Mo, B. Sikdar and H.T. Kaur).

3. *Fast Network Simulation Using Network Decomposition*, applied for US Patent on December 19, 2003, based on U.S. Provisional Application Serial No. 20040088148, published on 05/06/2004, (with Bin Mo).
4. *Use of machine learning for classification of magneto cardiograms*, applied for US Patent on July 1, 2004, USPTO 10/561,285, PCT/US04/21307, CardioMag Imaging, Inc. (with Karsten Sternickel and Mark Embrechts).
5. *Apparatus and method for conducting a recurring auction using a participant retention mechanism*, applied for US Patent on October 25, 2005, USPTO 11/258,476, Optimaret, Inc. (with Juong-Sik Lee).
6. *Apparatus and Method for the Probabilistic Allocation of Resources and Variable Pricing in Recurrent Auction*, applied for US Patent on October, 18, 2006, USPTO 11/570,674, Optimaret, Inc.

Selected Publications (out of more than 300)

Books Edited

1. B.K. Szymanski, *Parallel Functional Languages and Compilers*, Addison-Wesley, ACM Press Frontier Series, New York, 1991.
2. B.K. Szymanski, *Trends in Parallel Processing*, UNIDO Emerging Technology Series, Vienna, 1996, 84 pp.
3. B.K. Szymanski and B. Sinharoy, *Languages, Compilers and Run-Time Systems for Scalable Computers*, Kluwer Academic Publishers, 1996, 335 pp.
4. B.K. Szymanski and B. Yener, *Advances in Pervasive Computing and Networking*, Springer, 2005, 296 pp.

Selected Journal papers

5. J. Dobosz, M. Halski, and B.K. Szymanski, "JOSK Compiler for ODRA/1304 Computers," *Archiwum Automatyki i Telemekhaniki*, **20**(3), pp. 301-310, 1975 (in Polish).
6. J. Bankowski, J. Dobosz, K. Fialkowski, M. Halski, T. Sarnecki, and B.K. Szymanski, "Survey of Program Optimization Methods," *Informatyka* **10**(5), pp. 3-6, 1975 (in Polish).
7. J. Bankowski, J. Dobosz, K. Fialkowski, M. Halski, T. Sarnecki, and B.K. Szymanski, "MERA-BASIC Language Implementation," *Informatyka* **11**(7), pp. 2-5, 1976 (in Polish).
8. B.K. Szymanski, "An Optimum Length of Fixed-Size Multiword List Items," *Bulletin de l'Academia Polonaise des Sciences*, Ser. Scien. Techn., **25**(9), pp. 89-93, 1976.
9. J. Bankowski, J. Dobosz, K. Fialkowski, M. Halski, T. Sarnecki, and B.K. Szymanski, "BASIC Language for MERA-305 Minicomputers," *Informatyka* **12**(3), pp. 1-4, 1977 (in Polish).
10. A. Minczuk and B.K. Szymanski, "A Representation of an Electric Power Distribution Graph," *Archiwum Elektrotechniki* **27**(2), pp. 367-380, 1978 (in Polish).
11. B.K. Szymanski, "Trends in Development of Relational Model of Data," *Informatyka* **14**(6), pp. 36-39, 1979 (in Polish).
12. I. Domaszewska, and B.K. Szymanski, "Translator of a Language for CAD of Electric Power Distribution Networks," *Elektryka* **55**, pp. 35-45, 1979 (in Polish).
13. A. Minczuk, and B.K. Szymanski, "Optimization of Computer Representation of Electric Power Distribution Networks," *Elektryka* **55**, pp. 47-55, Warsaw, 1979 (in Polish).
14. B.K. Szymanski, "Relationinterface fur die Informationsdatenbanken," *Dokumentation/Information*, **45**, pp. 84-101, special issue on XI Colloquium on Information und Documentation, Oberhof, Germany, 1979 (in German).
15. J. Bankowski and B.K. Szymanski, "JOSK-A Syntax Description Language," *Weiterbildungszentrum fur Mat. Kyb. und Rechentechn.* **38**(1), UT Dresden, Germany, pp. 85-115, special issue on Int. WG4 Meeting on Definition and Implementation of Specialized Languages, Budapest, Hungary, 1979.

16. S. Kujszczyk, and B.K. Szymanski, "Double-Chained List Structure for Electric Power Distribution Network," *Przegląd Elektrotechniczny* **56**(11), pp. 477-479, 1980 (in Polish).
17. B.K. Szymanski, "Relational Interface to ISIS Databases," *Aktualne Problemy Informatyki and Dokumentacji* **25**(5/6), pp. 22-28 1980 (in Polish).
18. J. Bankowski, J. Dobosz, S. Romanski, B.K. Szymanski and E. Zabza-Tarka, "Software for Relational Access to CDS/ISIS Files," *Informatyka* **16**(1), pp. 17-21, 1981 (in Polish).
19. J. Bankowski, J. Dobosz, K. Fialkowski, M. Halski, T. Sarnecki, and B.K. Szymanski, "JOSK Language—Towards Automatic Translator Generation," *Information Systems*, **5**(2), pp. 158-159, 1980.
20. J. Dobosz and B.K. Szymanski, "An Implementation of a Relational Interface to an Information System," *Information Systems*, **6**(3), pp. 219-228, 1981.
21. H. Rybinski and B.K. Szymanski, "Multilevel Information System—Toward More Flexible Information Systems," *Information Processing and Management*, **17**(4), pp. 277-290, 1981.
22. K. Fialkowski, H. Rybinski, and B.K. Szymanski, "Information Flow in National System of Scientific, Technical and Organizational Information," *Int. Forum on Information and Documentation*, **7**(2), pp. 28-30, 1982.
23. M. Sulej and B.K. Szymanski, "Design of a Specialized Hardware Device for Data Selection and Transformation," *Microprocessing and Microprogramming*, **10**(4), pp. 255-259, 1982.
24. J. Dobosz, S. Romanski, B.K. Szymanski, and E. Zabza-Tarka, "Relational Access to Data in Information System: Research, Development and Applications," *Nauchno-Tekhnicheskaya Informatsiya* **16**(4), Ser. 2, pp. 4-9, 1982 (in Russian), English translation in *Automatic Documentation and Mathematical Linguistics*, **16**, No. 2, pp. 54-63, 1983.
25. B.K. Szymanski, Y. Shi, and N. Prywes, "Synchronized Distributed Termination," *IEEE Transactions on Software Engineering*, **SE-11**, No. 10, pp. 1136-1140, October 1985.
26. J. Tseng, Y. Shi, B.K. Szymanski, and N. Prywes, "Real-Time Software Life Cycle with the MODEL System," *IEEE Transactions on Software Engineering*, **SE-12**, No. 2, pp. 358-373, February 1986.
27. N. Prywes, Y. Shi, B.K. Szymanski, and J. Tseng, "Supersystem Programming with Model," *IEEE Computer*, **19**, No. 2, pp. 50-60, February, 1986.
28. B.K. Szymanski, "Parallel Programming with Recurrent Equations," *Int. Journal on Supercomputer Applications*, **1**, No. 2, pp. 44-74, 1987.
29. Y. Shi, N. Prywes, A. Pnueli, and B.K. Szymanski, "Very High Level Concurrent Programming," *IEEE Transactions on Software Engineering*, **SE-13**, No. 8, pp. 1038-1046, September 1987.
30. B.K. Szymanski and N. Prywes, "Efficient Handling of Data Structures in Definitional Languages," *Science of Computer Programming*, **10**, No. 3, pp. 221-245, 1988.
31. B. McKenney and B.K. Szymanski, "Generating Parallel Code for SIMD Machines," *ACM Letters on Programming Languages and Systems*, **1**, No. 1, March 1992, pp. 59-73.
32. B.K. Szymanski and B. Sinharoy, "Complexity of the Closest Vector Problem in a Lattice Generated by (0,1)-Matrix," *Information Processing Letters*, **42**, No. 3, pp. 121-126, May 1992.
33. W. Maniatty, B. Sinharoy, and B.K. Szymanski, "Efficiency of Data Alignment on MasPar," *ACM SIGPLAN Notices*, **28**, No. 1, pp. 48-51, January 1993, special issue with *Proc. II Workshop on Languages, Compilers, and Run-Time Environments for Distributed Memory Multiprocessors*, Boulder, CO, September 1992.
34. B.K. Szymanski, "Parallel Computers and Their Industrial Applications," *Microelectronics Monitor*, **45/46**, 1994, pp. 76-82.
35. B.K. Szymanski and T. Caraco, "Spatial Analysis of Vector-Borne Disease: A Four Species Model," *Evolutionary Ecology*, **8**, No. 3, 1994, pp. 299-314.
36. B. Sinharoy and B.K. Szymanski, "Finding Optimum Wavefront of Parallel Computation," *Journal of Parallel Algorithms and Applications*, **2**, No. 1, 1994, pp. 5-26.

37. B. Sinharoy, C. Ozturan, and B.K. Szymanski, "Compiler Technology for Parallel Scientific Computation," *Scientific Programming*, **3**, No. 3, 1994, pp. 201-225.
38. B. Sinharoy and B.K. Szymanski, "Data and Task Alignment in Distributed Memory Architectures," *Journal of Parallel and Distributed Computing*, **21**, No. 1, pp. 61-74, April 1994.
39. B.K. Szymanski, "Trends in Software Engineering for Parallel Processing," *Microelectronics Monitor*, **2**, no. 2, 1995, pp. 1-13.
40. B.K. Szymanski, "An Upper Bound for a Time Step in Parallel Spatially Explicit Biological Simulations," *System Analysis, Modelling and Simulation*, **18-19**, 1995, pp. 717-720 (special issue with *Proc. 5th IMACS Symposium on System Analysis and Simulation*, Berlin, June 1995).
41. B.K. Szymanski, W. Maniatty, and B. Sinharoy, "Simultaneous Parallel Reduction," *Parallel Processing Letters*, **5**, no. 3, Sept. 1995, pp. 437-449.
42. B. Sinharoy and B.K. Szymanski, "Memory Optimization for Parallel Functional Programs," *Computing Systems in Engineering*, **6**, nos 4/5, Oct. 1995, pp. 415-422.
43. C. Norton, B.K. Szymanski, and V. Decyk, "Object-Oriented Parallel Computation for Plasma Simulation," *Communication of the ACM*, **38**, no. 10, Oct. 1995, pp. 88-100.
44. W. Kaplow and B.K. Szymanski, "Program Optimization Based on Compile-Time Cache Performance Prediction," *Parallel Processing Letters*, **6**, no. 1, March 1996, pp. 173-184.
45. B.K. Szymanski, "Paradigms and Compilers for Parallel Processing," *Scientific Programming*, **6**, no. 2, Summer 1997, pp. 159-162.
46. C. Norton, B.K. Szymanski, and V. Decyk, "On Parallel Object Oriented Programming in Fortran90," *ACM Applied Computing Review*, **4**, no. 1, Spring 1996, pp. 27-31.
47. B. Sinharoy and B.K. Szymanski, "Parallelising Compilers and Systems," *Journal of Parallel Algorithms and Applications*, **12**, no. 1-3, 1997, pp. 5-20.
48. V. Decyk, C. Norton, and B.K. Szymanski, "Expressing Object-Oriented Concepts in Fortran90," *ACM Fortran Forum*, **16**, no. 1, April 1997, pp. 13-18.
49. W. Maniatty and B.K. Szymanski, "Fine-Grain Discrete Voronoi Diagram Algorithm in L_1 and L_∞ Norms," *Mathematical and Computer Modelling*, **26**, no. 4, 1997, pp. 71-78.
50. W. Kaplow and B.K. Szymanski, "Tiling for Parallel Execution - Optimizing Node Cache Performance," *Parallel Processing Letters*, **7**, no. 4, 1997, pp. 393-407.
51. J.E. Flaherty, R.M. Loy, M.S. Shephard, B.K. Szymanski, J.D. Teresco, and L.H. Ziantz, "Adaptive Local Refinement with Octree Load-Balancing for the Parallel Solution of Three-Dimensional Conservation Laws," *Journal of Parallel and Distributed Computing*, **47**, pp. 139-152, 1997.
52. V. Decyk, C. Norton, and B.K. Szymanski, "How to Express C++ Concepts in Fortran 90," *Scientific Programming*, **6**, No. 4, Winter 1997, pp. 363-390.
53. W. Maniatty, B.K. Szymanski, and T. Caraco, "Parallel Computing with Generalized Cellular Automata" *Parallel and Distributed Computing Practices*, **1**, no. 1, 1998, pp. 31-50.
54. J.E. Flaherty, R.M. Loy, C. Ozturan, M.S. Shephard, B.K. Szymanski, J.D. Teresco and L.H. Ziantz, "Parallel Structures and Dynamic Load Balancing for Adaptive Finite Element Computation," *Applied Numerical Mathematics*, **26**, no. 1-2, 1998, pp. 241-263.
55. V. Decyk, C. Norton, and B.K. Szymanski, "Expressing Object-Oriented Concepts in Fortran 90," *NASA Technology Briefs*, **22**, No. 3, March 1998, pp. 100-101.
56. T. Caraco, M.C. Duryea, G. Gardner, W. Maniatty, and B.K. Szymanski, "Host Spatial Heterogeneity and Extinction of an SIS Epidemics," *Journal of Theoretical Biology*, **192**, pp. 351-361, 1998.
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Invited Papers

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266. B.K. Szymanski, K. El Maghraoui, T. Desell and C. Varela, "The Effects of Heterogeneity on Asynchronous Panmictic Genetic Search," *Proc. 6th International Conference on Parallel Processing and Applied Mathematics (PPAM07)*, Gdansk, Poland, LNCS, vol. 4967, Springer, Berlin/Heidelberg, 2008, pp. 457-468.

Selected Invited Talks

- Academic Institutions in US: Harvard University, Boston, MA; Stanford University, Stanford, CA; New York University, New York, NY; Rice University, Houston, TX; University of Maryland, College Park, MD; University of California, Berkeley, CA; University of Pennsylvania, Philadelphia, PA; University of Southern California, Los Angeles, CA; Yale University, New Haven, CT; University of California, Los Angeles, CA; Texas A&M University, College Station, TX; Dartmouth College, Hanover, NH; University of Florida, Gainesville, FL; Information Science Institute, Los Angeles, CA; Ohio State University, Columbus, OH; Case Western University, Cleveland, OH; Cuyahoga Valley ACM Chapter, Akron, OH; Drexel University, Philadelphia, PA; Duke University, Durham, NC; Florida A&M University, Tallahassee, FL; Greater Dayton ACM Chapter, Dayton, OH; Hartford Graduate Center, Hartford, CT; Kent State University, Akron, OH; Michigan Technological University, Hancock, MI; Queens College, New York City, NY; Rensselaer Polytechnic Institute, Troy, NY; SUNY, Albany, NY; University of Alabama, Birmingham, Alabama; University of Central Florida, Orlando, FL; University of Delaware, Newark, DE; University of North Carolina, Charlotte, NC; Worcester Polytechnic University, Worcester, MA; Wright State University, Fairborn, OH; University of Tennessee, Knoxville, TN.
- Academic Institutions outside US: Oxford University, Oxford, U.K., Cambridge University, Cambridge, U.K., Imperial College, London, U.K., Tokyo University, Tokyo, Japan; Academia Sinica, Taipei, Taiwan; AGH, Krakow, Poland; Australian National University, Canberra, Australia; Budapest University of Economic Sciences, Hungary; Canterbury University at Christchurch, New Zealand; Chinese University of Hong Kong, Hong Kong; Deakin University at Geelong, Australia; Deakin University at Melbourne, Australia; Ecole TCA, Paris, France; Fibonacci Institute of Foundations of Computer Science, Trento, Italy; Hungarian Academy of Sciences, Budapest, Hungary; Indian Computer Society, New Delhi, India; McGill University, Montreal, Canada; University of Gerona, Spain; University of Sao Paulo, Sao Paulo, Brazil; University of Science and Technology, Hong Kong; University of Vienna, Vienna, Austria; Warsaw Technical University, Warsaw, Poland; Western Cape University, Cape Town, South Africa, Weizmann Institute of Science, Rehovot, Israel, Peking University, Beijing, China.
- Governmental and Industrial Laboratories: Boeing Computing Services, Seattle, WA; CISCO, San Jose, CA; General Electric (Aerospace Division, Pittsfield, MA and Research Center, Schenectady, NY); Hewlett Packard, Language Laboratory, Chelmsford, MA; IBM (Almaden Research Laboratory, San Jose, CA, Future Direction Division, Poughkeepsie, NY, Haifa Research Group, Israel, Myers Corners Laboratory, NY, Zurich Research Laboratory, Switzerland, T.J. Watson Laboratory, White Plains, NY, Hursley Park, UK); ICASE, NASA Langley Research Center, Hampton, VA; Jet Propulsion Laboratory, Pasadena, CA; Lawrence Livermore National Laboratory, Livermore, CA; Lucent Technologies, Whippany, NJ; NASK, Warsaw, Poland; Naval Research (Laboratory, Washington, DC, Undersea Warfare System Center, New London, CT, Office of Naval Research, Washington, DC); Rome Air Force Laboratory, Rome, NY; Sandia National Laboratory, Albuquerque, New Mexico; Sony Computer Science Laboratory, Tokyo, Japan; Sun Research Laboratory, Burlington, MA; Create-Net, Trento, Italy.