

Research Associate Professor  
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## Education

Ph.D., Computer Science, State University of New York at Stony Brook, 1996.

B.S./M.S., Computer Science (with honors), St. Petersburg State Technical University, Russia, 1988.

## Research Interests

Formal specification and analysis of embedded and real-time systems, hybrid systems; process algebras, model checking, probabilistic modeling and analysis. Run-time verification. Formal methods in software engineering, architectural and behavioral modeling, model-driven test generation.

## Employment

- 7/2007-pres.    Research Associate Professor, Department of Computer and Information Science, University of Pennsylvania
- 7/2001-6/2007    Research Assistant Professor, Department of Computer and Information Science, University of Pennsylvania
- 9/1998-7/2001    Research Associate, Department of Computer and Information Science, University of Pennsylvania
- 1/1996-9/1998    Computer Scientist, Computer Command and Control Company, Philadelphia, PA
- 9/1991-5/1996    Graduate Student, Department of Computer Science, State University of New York at Stony Brook
- 9/1989-9/1991    Research Staff Member, Department of Computer Science, St. Petersburg Technical University, Russia
- 4/1988-8/1989    Software Engineer, Department of Research Automation, St. Petersburg Technical University, Russia

## Teaching

University of Pennsylvania:

- CIS 640 *Advanced Topics in Computer Systems*, Spring 2000  
Electronic Commerce Systems, Co-Instructor.
- CIS 640 *Advanced Topics in Computer Systems*, Fall 2000  
Guest lecture on hybrid systems modeling in CHARON.
- CIS 640 *Advanced Topics in Computer Systems*, Fall 2002  
Guest lectures on formal verification.
- EE 600 *Hybrid Systems*, Fall 2003  
Guest lecture on hybrid systems modeling in CHARON.
- CIS 700 *Integration of Embedded Systems*, Spring 2006.  
Guest lectures on architectural modeling.

## Ph.D. and M.Sc. Thesis Supervision

Jangwoo Shin, Ph.D. (co-advised with Noah Prywes). “A tool for understanding concurrent programs through state space.” December 2001. NetXentry, Technical Director.

Chaitanya Penubarthi, M.Sc. “Code generation for distributed hybrid models.” December 2004.

Usa Sammapun, Ph.D. (co-advised with Insup Lee). January 2007.

## Thesis Committee Participation

**SEAS:** Sebastian Burkhardt, Wonhong Nam, Mikhail Bernadsky, Madhukar Anand (in progress); Jongwoo Kim (Spring 2006); James Yang (Fall 2003).

**External:** Dezhuang Zhang (SUNY Stony Brook, Fall 2005), Stepan Nadrchal (Charles University, Czech Republic, Summer 2004).

## Professional Activities

Guest Editor, Special Issue on Real-time and Embedded Systems, *Journal of Computer and System Sciences*, Volume 73, Issue 2, 2007.

Program Chair (2005), General Chair (2006), and Finance Chair (2007), IEEE Real-Time and Embedded Technology and Applications Symposium.

Co-organizer (with F. Kordon), Workshop on Composition of Embedded Systems: Scientific and Industrial Issues, October 2006.

Co-organizer (with K. Havelund, B. Finkbeiner, and G. Rosu), Dagstuhl Seminar on Runtime Verification, January 2007.

Co-organizer (with I. Lee, J. Goldman, and S. Whitehead), Workshop of High-Confidence Medical Devices, Software, and Systems, and Medical Device Plug-and-Play, June 2007.

Co-organizer and Program Committee co-Chair (with J. Hatcliff and I. Lee), Workshop on Innovative Techniques for Certification of Embedded Systems, 2006.

Co-organizer and Program Committee co-Chair, International Workshop on Run-time Verification, 2003 (with M. Viswanathan) and 2007 (with S. Tasiran).

Tutorial and Workshops Chair, Real-Time Systems Symposium, 2005.

Workshops Co-Chair (with X. Zhou), IFIP International Conference on Embedded and Ubiquitous Computing, 2006.

Local Organization Chair, International Conference on Embedded Software, 2003.

Program Committee member:

IEEE Real-Time and Embedded Technology and Application Symposium, 2002, 2004, 2007; IEEE Real-time Systems Symposium, 2002, 2005–2007; IEEE International Symposium on Object-oriented Real-time distributed Computing, 2000, 2002, 2004; IEEE Conference on Real-Time Computing Systems and Applications, 2005–2007; ACM Conference on Embedded Software, 2005, 2006; European Conference on Real-Time Systems, 2006; International Conference on Intelligent Computer Communication and Processing, 2006; International Workshop on Run-time Verification, 2001–2007; International Workshop on Parallel and Distributed Real-Time Systems, 2002, 2006–2008; IEEE Workshop on Model-Driven Embedded Systems, 2003, 2004.

Session Chair:

International Workshop on Run-time Verification, 2001, 2005, 2006; Workshop on Software Engineering for Embedded Systems, 2003; Real-Time and Embedded Technology and Application Symposium, 2004, 2007; Workshop on Parallel and Distributed Real-Time Systems, 2006.

Co-Chair, Model Definition Language Working Group, DARPA BioComp program, 2002 - 2005.

## Honors and Awards

DARPA IPTO Special Commendation for outstanding achievement in the development of Bio-SPICE technology. May 2005.

## Recent and Current Research Funding

1. “Towards Trust Management in Service-Oriented Architectures” ONR MURI, Co-PI, with S. Kannan (PI), I. Lee, and M. Blaze.
2. “Resource Semantic Interfaces for Hierarchical Model-Driven Development of Embedded Systems,” AFOSR FA9550-07-1-0216. \$494,390 (2/15/2007–11/20/2009), Co-PI, with I. Lee.
3. “Design Verification and Validation of Software Systems Using Formal Methods,” FDA/TATRC IAG-224-06-6063. \$125,000 (10/02/2006–9/28/2007). Co-PI, with I. Lee.

4. “Workshop: Composition of Embedded Systems” (workshop support), NSF CNS-0635650. \$5,000 (9/15/2006–8/31/2007).
5. “Workshop: Composition of Embedded Systems” (workshop support), ARO W911NF-06-1-0372. \$15,000 (8/14/2006–8/13/2007).
6. “Techniques for Assuring the Safety and Reliability of Physical Computing Systems and Applications to Medical Devices,” NSF CNS-0509327. \$780,000 (7/1/2005–6/30/2009). Co-PI, joint with I. Lee, G. Pappas, and V. Rich.
7. “STTR Phase II: Simulation and Analysis Toolset for an Industry-Standard Embedded System Specification Language,” AFOSR STTR FA9550-04-C-0187, subcontract from Fremont Associates. Total amount: \$226,001 (9/30/2005–9/29/2007).
8. “Run-time Validation and Verification of Safety-critical Flight Control Systems,” AFOSR STTR, subcontract from Barron Associates. Total amount: \$75,000 (11/1/2005–3/14/2007).
9. “Enhancing Dependability of HCES”, ARO W911NF-05-1-0182. Total amount: \$225,000 (4/15/2005–4/14/2007). Co-PI, joint with I. Lee.
10. “Anomaly and Misuse Detection in Network Traffic Systems,” ONR MURI N00014-04-1-0735. Total amount: \$1,000,000 (6/1/04–5/31/06). Co-PI, joint with Sampath K. and I. Lee.
11. “Advanced Tool Integration for Embedded System Assurance,” ARO DAAD19-01-1-0473. Total amount \$4,984,330 (6/1/01–4/30/06). Co-PI, joint with R. Alur, C. Gunter, S. Kannan, I. Lee.
12. “Run-time Environment and Design Application for Polymorphous Technology, Phase II,” DARPA PCA F33615-00-C-1887, subcontract from Lockheed Martin. Total amount \$500,154 (4/1/03–12/31/05).
13. “Testing Based on Hybrid System Models,” NSF CCR-0209024. Total amount \$450,000 (9/15/02–8/31/05). Co-PI, joint with Insup Lee.
14. “STTR Phase I: Simulation and Analysis Toolset for an Industry-Standard Embedded System Specification Language,” AFOSR, subcontract from Fremont Associates. Total amount: \$30,000 (9/1/04–5/31/05).
15. “An Integrated Approach to Improving Design-Time and Run-Time Confidence.” NSF CCR-9988409. Total amount \$320,000 (5/1/00–6/30/03). Co-PI, joint with I. Lee.
16. “Run-time Environment and Design Application for Polymorphous Technology,” DARPA, subcontract from Lockheed Martin. Total amount \$200,000 (7/1/01–6/30/03). PI, joint with I. Lee.

## Publications:

### Edited Volumes:

1. O. Sokolsky and C. Gill (Eds.) Special Issue on Real-time and Embedded Systems. *Journal of Computer and Information Sciences*, Vol. 73, No. 2, March 2007.
2. X. Zhou, O. Sokolsky, L. Yan, E.-S. Jung, Z. Shao, Y. Mu, D.-C. Lee, D. Kim, Y.-S. Jeong, C.-Z. Xu (Eds.) "Emerging Directions in Embedded and Ubiquitous Computing," *Lecture Notes in Computer Science*, Vol. 4097. Springer, 2006.

### Journal Publications:

3. I. Lee, A. Philippou, and O. Sokolsky, "Resources in Process Algebra," *Journal of Logic and Algebraic Programming*, Vol. 72, pp. 98-122, May/June 2007.
4. Á. Halász, V. Kumar, M. Imieliński, C. Belta, O. Sokolsky, S. Pathak, H. Rubin, "Analysis of Lactose Metabolism in E. Coli Using Reachability Analysis of Hybrid Systems," *IET Systems Biology*, Volume 1, Issue 2, pp. 130-148, March 2007.
5. O. Mondragon, A. Gates, H. Mendoza, and O. Sokolsky, "Generating Properties for Runtime Monitoring from Software Specification Patterns," *International Journal of Software Engineering and Knowledge Engineering*, February 2007.
6. R. Alur, R. Grosu, I. Lee, and O. Sokolsky, "Compositional Modeling and Refinement for Hierarchical Hybrid Systems," *Journal of Logic and Algebraic Programming*, Vol. 68, pp. 105-128, March 2006.
7. M. Kim, S. Kannan, I. Lee, O. Sokolsky, M. Viswanathan, "Java-MaC: a Rigorous Runtime Assurance Tool for Java Programs," *Formal Methods in Systems Design*, Vol 24, No 2, March 2004.
8. R. Alur, T. Dang, J. Esposito, R. Fierro, Y. Hur, F. Ivancic, V. Kumar, I. Lee, P. Mishra, G. Pappas, O. Sokolsky, "Hierarchical Modeling and Analysis of Embedded Systems," *Proceedings of the IEEE*, Vol. 90 (1), January 2003, pp. 11-28.
9. I. Lee, A. Philippou, and O. Sokolsky, "Process Algebraic Modelling and Analysis of Power-Aware Real-Time Systems," *IEE Computing and Control Engineering Journal*, 13(4), August 2002, pp. 180-188.
10. K. Bhargavan, C.A. Gunter, M. Kim, I. Lee, D. Obradovic, O. Sokolsky, and M. Viswanathan, "Verisim: Formal Analysis of Network Simulations," *Transactions on Software Engineering*, Vol. 28, No. 2, Feb. 2002, pp. 129-145.
11. H.-H. Kwak, I. Lee and O. Sokolsky, "Parametric approach to the specification and analysis of real-time scheduling based on ACSR-VP," *Science of Computer Programming*, Vol. 42, Issue 1, Jan. 2002, pp. 49-60.
12. A. Philippou, O. Sokolsky, I. Lee, R. Cleaveland, and S.A. Smolka, "Hiding Resources that Can Fail: An Axiomatic Perspective," *Information Processing Letters*, Vol. 80, Issue 1, Oct. 2001, pp. 3-13.

13. O. Sokolsky, I. Lee, and H. Ben-Abdallah, "Specification and analysis of real-time systems with PARAGON," *Annals of Software Engineering*, vol. 7 (1999), pp. 211–234.
14. B.L. Gelman, B.S. Hotz, and O. Sokolsky, "Strata Algebra and Parallel Architecture," *Int. Journal on Systems Research and Information Science*, vol. 4, 1990, pp. 45-68.

**Book chapters:**

14. A. Philippou and O. Sokolsky, "Process-Algebraic Analysis of Timing and Schedulability Properties," to appear in "*Handbook of Real-Time and Embedded Systems*" Chapman and Hall/CRC, 2007.
15. R. Cleaveland and O. Sokolsky, "Equivalence and Preorder Checking for Finite-State Systems," in "*Handbook of Process Algebra*," pp. 391–424, Elsevier, 2001.
16. S.A. Smolka, O. Sokolsky, and S. Zhang, "On the Parallel Complexity of Bisimulation and Model Checking," in "*Modal Logic and Process Algebra*," pp. 257–288, Cambridge University Press, 1995.

**Refereed conference proceedings:**

17. A. Easwaran, I. Shin, O. Sokolsky, and I. Lee, "Incremental Schedulability Analysis of Hierarchical Real-Time Components," 6<sup>th</sup> ACM International Conference on Embedded Software (EMSOFT 2006), October 2006.
18. M. Anand, I. Lee, O. Sokolsky, and G. Pappas, "Unit and Dynamic Typing in Hybrid Systems Modeling with CHARON," IEEE International Symposium on Computer-Aided Control Systems Design (CACSD 2006), October 2006. To appear.
19. S. Fischmeister, O. Sokolsky, and I. Lee, "Network-Code Machine: Programmable Real-Time Communication Schedules," 12<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'06), pp. 311-324, April 2006.
20. F. Kratz, O. Sokolsky, G. J. Pappas, I. Lee, "R-Charon, a Modeling Language for Reconfigurable Hybrid Systems," 9th International Workshop on Hybrid Systems: Computation and Control (HSCC 2006), pp. 392-406, March 2006.
21. O. Sokolsky, S. Kannan, and I. Lee, "Simulation-Based Graph Similarity," 12<sup>th</sup> International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'06), LNCS 3920, pp. 426-440, March 2006.
22. U. Sammapun, I. Lee, and O. Sokolsky, "RT-MaC: Runtime Monitoring and Checking of Quantitative and Probabilistic Properties," 11<sup>th</sup> IEEE Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA '05), pp. 147-153, August 2005.
23. O. Mondragon, A. Gates, H. Mendoza, and O. Sokolsky, "Generating Properties for Runtime Monitoring from Software Specification Patterns," 17<sup>th</sup> International Conference on Software Engineering and Knowledge Engineering (SEKE '05), July 2005.

24. A. Q. Gates, S. Roach, I. Gallegos, O. Ochoa, O. Sokolsky, “Java-MaC and Runtime Monitoring for Geoinformatics Grid Services,” *10<sup>th</sup> IEEE International Workshop on Object-Oriented Real-Time Dependable Systems (WORDS 2005)*, pp. 105-112, February 2005.
25. L. Tan, J. Kim, O. Sokolsky, and I. Lee, “Model-based Testing and Monitoring for Hybrid Embedded Systems”, *IEEE International Conference on Information Reuse and Integration (IEEE IRI-2004)*, November 2004.
26. L. Tan, O. Sokolsky, and I. Lee, “Specification-based Testing with Linear Temporal Logic,” *IEEE International Conference on Information Reuse and Integration (IEEE IRI-2004)*, November 2004.
27. R. Alur, F. Ivancic, J. Kim, I. Lee, and O. Sokolsky, “Generating Embedded Software from Hierarchical Hybrid Models”, *International Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES '03)*, pp. 171–182, June 2003.
28. H.S. Hong, S.D. Cha, I. Lee, O. Sokolsky, and H. Ural, “Data Flow Testing as Model Checking”, *International Conference on Software Engineering (ICSE '03)*, pp. 232–242, May 2003,
29. O. Sokolsky, A. Philippou, I. Lee, and K. Christou, “Modeling and Analysis of Power-Aware Systems”, *International Conference on Tools and Algorithms for Construction and Analysis of Systems (TACAS '03)*, LNCS 2619, pp. 409–424, April 2003.
30. R. Alur, C. Belta, F. Ivancic, V. Kumar, H. Rubin, J. Schug, O. Sokolsky, and J. Webb, “Visual programming for modeling and simulation of biomolecular regulatory networks”, *International Conference on High Performance Computing*, LNCS 2552, pp. 702–712, December 2002.
31. H.S. Hong, I. Lee, O. Sokolsky, and H. Ural, “A Temporal Logic Based Theory of Test Coverage and Generation,” *International Conference on Tools and Algorithms for Construction and Analysis of Systems (TACAS '02)*, April 2002.
32. I. Lee, J.-Y. Choi, H. H. Kwak, A. Philippou, O. Sokolsky, “A Family of Resource-Bound Real-Time Process Algebras,” *Proceedings of International Conference on Formal Techniques for Networked and Distributed Systems (FORTE 2001)*, pp 443-458, August 2001.
33. R. Alur, R. Grosu, I. Lee, and O. Sokolsky, “Compositional Refinement for Hierarchical Hybrid Systems,” *International Workshop on Hybrid Systems: Computation and Control*, LNCS 2034, pp. 33–48. March, 2001.
34. A. Philippou, I. Lee, and O. Sokolsky, “Weak Bisimulation for Probabilistic Systems,” *CONCUR '00*, August 2000.
35. D. Gordon, W. Spears, O. Sokolsky, and I. Lee, “Distributed Spatial Control and Global Monitoring of Mobile Agents,” *IEEE International Conference on Information, Intelligence, and Systems*, November 1999.

36. I. Lee, S. Kannan, M. Kim, O. Sokolsky, and M. Viswanathan, "Runtime Assurance Based On Formal Specifications", International Conference on Parallel and Distributed Processing Techniques and Applications, June 28 - July 1, 1999.
37. M. Kim, M. Viswanathan, H. Ben-Abdallah, S. Kannan, I. Lee, and O. Sokolsky, "Formally Specified Monitoring of Temporal Properties," European Conference on Real-Time Systems, pp. 114-121, June 1999.
38. Y. Dong, X. Du, Y.S. Ramakrishna, C.R. Ramakrishnan, I.V. Ramakrishnan, S.A. Smolka, O. Sokolsky, E.W. Stark and D.S. Warren, "Fighting Livelock in the i-protocol: A Comparative Study of Verification Tools," TACAS '99, pp. 74-88, March 1999.
39. H.-H. Kwak, J.-Y. Choi, I. Lee, A. Philippou, and O. Sokolsky, "Symbolic Schedulability Analysis of Real-time Systems," IEEE Real-Time Systems Symposium, December 1998.
40. A. Philippou, O. Sokolsky, I. Lee, R. Cleaveland, and S. Smolka, "Probabilistic Resource Failure in Real-Time Process Algebra," CONCUR'98, September 1998.
41. O. Sokolsky, M. Younis, I. Lee, H.-H. Kwak, and J. Zhou, "Verification of the Redundancy Management System for Space Launch Vehicle," IEEE Real-Time Applications and Technology Symposium, pp. 220-229, June 1998.
42. N. Prywes, P. Rehmert, O. Sokolsky and I. Lee, "Retrospective Exploration of Safety Properties in Real-Time Concurrent Systems," IEEE Digital Avionics Systems Conference, October 1997.
43. H. Ben-Abdallah, I. Lee and O. Sokolsky, "Operational Semantics for Visual Simulation in PARAGON", IEEE National Aerospace and Electronics Conference, July 1997.
44. D. Clarke, H. Ben-Abdallah, I. Lee, O. Sokolsky, "PARAGON: A Paradigm for the Specification, Verification and Testing of Real-Time Systems," 1997 IEEE Aerospace Conference, pp. 469-488, February 1997.
45. R. Cleaveland, P.M. Lewis, S.A. Smolka, and O. Sokolsky, "The Concurrency Factory: A Development Environment for Concurrent Systems," pp. 398-401, Computer Aided Verification '96, July 1996.
46. D. Clarke, H. Ben-Abdallah, I. Lee, H.-L. Xie, O. Sokolsky, "XVERSA: an integrated graphical and textual toolset for the specification and analysis of resource-bound real-time systems," Computer-Aided Verification '96, pp. 402-405, July 1996.
47. R. Cleaveland, P.M. Lewis, S.A. Smolka, and O. Sokolsky, "The Concurrency Factory Software Development Environment," TACAS '96, pp. 391-395, March 1996.
48. O. Sokolsky, S.A. Smolka, "Local Model Checking for Real-Time Systems," Computer-Aided Verification '95, pp. 211-224, July 1995.
49. S. Zhang, S.A. Smolka, and O. Sokolsky, "On the Parallel Complexity of Model Checking in the Modal Mu-Calculus," Proceedings of Ninth Annual IEEE Symposium on Logic in Computer Science, pp. 154-163, July 1994.

50. O. Sokolsky and S.A. Smolka, “Incremental Model Checking in the Modal Mu-Calculus,” *Computer-Aided Verification '94*, pp. 351–363, June 1994.

**Workshop and non-refereed conference proceedings:**

51. O. Sokolsky, I. Lee, and D. Clarke, “Schedulability Analysis of AADL Models,” *Workshop on Parallel and Distributed Real-Time Systems (WPDRTS '06)*, April 2006.
52. H. S. Hong, I. Lee, and O. Sokolsky, “Abstract Slicing: A New Approach to Program Slicing Based on Abstract Interpretation and Model Checking,” *5<sup>th</sup> International Workshop on Source Code Analysis and Manipulation (SCAM)*, pp. 25-34, Sept 30–Oct 1, 2005.
53. A. Easwaran, S. Kannan, and O. Sokolsky, “Steering of Discrete Event Systems: Control Theory Approach,” *5th International Workshop on Run-time Verification, ENTCS 144(4)*, pp. 21-39, July 2005.
54. O. Sokolsky, U. Sammapun, I. Lee, and J. Kim, “Run-Time Checking of Dynamic Properties,” *5th International Workshop on Run-time Verification, ENTCS 144(4)*, pp. 91-108, July 2005.
55. I. Lee, A. Philippou, and O. Sokolsky, “Formal Methods for Schedulability Analysis of Real-Time Embedded Systems,” *Proceedings of the European Summer School on Embedded Systems, July–October 2003*, pp. 74–76. MRTC Technical Report 119/2004, Mälardalens Högskola, 2004.
56. M. DeLap, B. Knutsson, H. Lu, O. Sokolsky, U. Sammapun, I. Lee, and C. Tsarouchis, “Is Runtime Verification Applicable to Cheat Detection?,” *ACM SIGCOMM Workshop on Network and System Support for Games (NetGames '04)*, August 2004.
57. O. Sokolsky and G. Pappas, “Platform-Independent Autonomy Modeling,” *Proceedings of the 4th International Conference on Intelligent Systems Design and Applications (ISDA 2004)*, August 2004.
58. U. Sammapun, A. Easwaran, I. Lee, O. Sokolsky, “Simulation of Simultaneous Events in Regular Expressions for Run-Time Verification,” *4<sup>th</sup> International Workshop on Run-time Verification, ENTCS 113*: 123-143, April 2004.
59. O. Sokolsky, “Resource Modeling for Embedded Systems Design,” *Proceedings of the Workshop on Software Technologies for Future Embedded and Ubiquitous Computing (WSTFEUS 2004)*, May 2004.
60. U. Sammapun and O. Sokolsky, “Regular Expression for Run-Time Verification”, *Workshop on Automated Technology for Verification and Analysis*, December 2003.
61. I. Lee and O. Sokolsky, “Supporting Model-Based Validation at Run Time”, *IEEE Workshop on Model-Based Embedded Systems*, May 2003.

62. I. Lee, A. Philippou, and O. Sokolsky, "A General Resource Framework for Real-Time Systems", Workshop on Radical Innovations of Software and Systems Engineering in the Future, LNCS 2941, pp. 234–248, October 2002.
63. M. Kim, S. Kannan, I. Lee, O. Sokolsky, and M. Viswanathan "Computational analysis of Run-Time Monitoring," International Workshop on Run-time Verification, ENTCS 70(4), July 2002.
64. M. Kim, I. Lee, U. Sammapun, J. Shin, and O. Sokolsky, "Monitoring, Checking, and Steering of Real-Time Systems," International Workshop on Run-time Verification, ENTCS 70(4), July 2002.
65. I. Lee, A. Philippou, and O. Sokolsky, "Formal Modeling and Analysis of Power-Aware Real-Time Systems," IEEE Real-Time Embedded Systems Workshop, December 2001.
66. E. Aaron, D. Metaxas, F. Ivancic, O. Sokolsky, "A framework for reasoning about animation systems," Proceedings of Workshop on Intelligent Virtual Agents, LNAI 2190, pp. 47–60, September 2001.
67. O. Sokolsky and H.S. Hong, "Qualitative Modeling of Hybrid Systems," Workshop on Formal Models in Software Development, June 2001.
68. H.S. Hong, I. Lee, O. Sokolsky, and S.D. Cha, "Automatic Test Generation using Model Checking," Workshop on Formal Approaches to Testing of Software, BRICS Notes Series NS-01-4, pp. 15–31, August 2001.
69. J.E. Hilger, I. Lee, and O. Sokolsky, "Comparative Analysis of Design Alternatives in Embedded Systems," IEEE Workshop on Real-Time Mission-Critical Systems, December 1999 (CD-ROM proceedings, 5 pages).
70. O. Sokolsky, M. Viswanathan, I. Lee, M. Kim, and S. Kannan, "Steering of Real-Time Systems Based on Monitoring and Checking," 5th International Workshop on Object-Oriented Real-Time Dependable Systems, pp. 10-17, November 1999.
71. A. Philippou, O. Sokolsky, I. Lee, R. Cleaveland, and S. Smolka, "Specifying Failures and Recoveries in PACSR," Workshop on Probabilistic Methods in Verification, University of Birmingham Technical Report CSR-98-4, pp. 153-167, June 1998.
72. I. Lee and O. Sokolsky, "A Graphical Property Specification Language," 2nd IEEE Workshop on High-Assurance Systems Engineering, pp. 42–47, August 1997.
73. R. Cleaveland, J.N. Gada, P.M. Lewis, S.A. Smolka, O. Sokolsky, and S. Zhang, "The Concurrency Factory - Practical Tools for Specification, Simulation, Verification, and Implementation of Concurrent Systems," Proceedings of DIMACS Workshop on Specification of Parallel Algorithms, Princeton, pp. 75–90, May 1994.

### Invited presentations:

1. “Analysis of Simulation Traces by Run-time Verification,” Invited tutorial, Conference on Quantitative Evaluation of Systems (QEST 2006), September 2006.
2. “Formal Analysis of Network Simulations,” Dagstuhl Seminar on Simulation and Verification of Dynamic Systems,” March 2006.
3. “Run-time Verification,” North Carolina State University, January 2004.
4. “A General Resource Framework for Real-Time Systems”, Workshop on Radical Innovations of Software and Systems Engineering in the Future, October 2002.
5. “Qualitative modeling of hybrid systems,” Workshop on Formal Models in Software Development, June 2001.
6. “Comparative Analysis of Design Alternatives in Embedded Systems”, Workshop on Modelling Software System Structures in a Fastly Moving Scenario, June 2000.

### Software developed:

- 1992–1995 **Concurrency Factory** - process-algebraic CASE tool.
- 1996–1998 **PARAGON** - process-algebraic CASE tool.
- 1998–1999 **PACSR** - probabilistic analysis of real-time systems.
- 1999–2002 **Java-MaC** - run-time verification of Java programs.
- 2000–2003 **CHARON** - modeling and analysis of hybrid systems.