

# Rastislav Bodik

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## RESEARCH INTERESTS

*Programming systems:* program synthesis with applications in web browsers, systems biology, and end-user programming; domain-specific languages, static and dynamic program analysis, hardware support for program analysis and compilation.

## POSITIONS

<b>Professor</b> Computer Science and Engineering, University of Washington	<b>July 2015 – present</b>
<b>Professor</b> Computer Science, University of California, Berkeley	<b>July 2012 – June 2015</b>
<b>Associate Professor</b> Computer Science, University of California, Berkeley	<b>July 2007 – June 2012</b>
<b>Assistant Professor</b> Computer Science, University of California, Berkeley	<b>August 2002 – July 2007</b>
<b>Assistant Professor</b> Computer Sciences, University of Wisconsin–Madison	<b>November 1999 – July 2002</b>

## AWARDS

- **ISCA Influential Paper Award**, ACM SIGARCH and IEEE-CS TCCA 2016
- **Outstanding Advisor**, CS Graduate Student Association, UC Berkeley 2011
- **IEEE MICRO Top Pics from Computer Architecture Conferences** 2007
- **Best Paper Award**, PLDI 2005 2005
- **Hellman Family Faculty Fund Award**, UC Berkeley 2005
- **IEEE MICRO Top Pics from Computer Architecture Conferences** 2004
- **HPC Software Challenge (Honorable Mention), Supercomputing** 2004
- **Okawa Research Grant** 2004
- Paper *Complete Removal of Redundant Expressions* selected for **20 Years of PLDI** 2002
- **Students' Choice Professor of the Year Award**, UW, Computer Sciences 2001
- **NSF CAREER** 2001
- **ACM SIGPLAN Doctoral Dissertation Award** 2001
- **Carolyn Rosner Excellent Educator Award**, UW, Computer Sciences 2000
- **IBM Faculty Partnership Award** 2000 to 2002
- **Taulbee Award for Teaching and Research Excellence**, Un. of Pittsburgh, C.S. 1996
- **Mellon Predoctoral Fellowship**, University of Pittsburgh 1994 and 1995

## EDUCATION

<b>PhD in Computer Science</b> University of Pittsburgh, Pittsburgh, PA	<b>1999</b>
<b>Diploma in Computer Engineering</b> Technical University, Kosice, Slovakia	<b>1992</b>

## PUBLICATIONS

### Journal papers

1. Ali Sinan Köksal, Kirsten Beck, Dylan R. Cronin, Aaron McKenna, Nathan D. Camp, Saurabh Srivastava, Matthew E. MacGilvray, Rastislav Bodík, Alejandro Wolf-Yadlin, Ernest Fraenkel, Jasmin Fisher, Anthony Gitter, "Synthesizing Signaling Pathways from Temporal Phosphoproteomic Data," , 1, pages 1-tbd, 2018.
2. Perry de Valpine, Daniel Turek, Christopher J. Paciorek, Clifford Anderson-Bergman, Duncan Temple Lang & Rastislav Bodik, "Programming with models: writing statistical algorithms for general model structures with NIMBLE," *Journal of Computational and Graphical Statistics* , , pages 1-28, 2016.
3. Jasmin Fisher, Nir Piterman, Rastislav Bodik, "Towards Synthesizing Executable Models in Biology," *Frontiers in Bioengineering and Biotechnology*, 2(75), pages 1-19, 2014.
4. Rastislav Bodik and Barbara Jobstmann, "Algorithmic Program Synthesis: Guest Editors' Introduction," *International Journal on Software Tools for Technology Transfer*, 15 (5-6), pages 397-411, 2013.
5. Krste Asanovic, Rastislav Bodik, James Demmel, Tony Keaveny, Kurt Keutzer, John Kubiawicz, Nelson Morgan, David A. Patterson, Koushik Sen, John Wawrzynek, David Wessel, Katherine A. Yelick, " A view of the parallel computing landscape," *Communications of the ACM*, 52(10), pages 56-67, 2009.
6. Rastislav Bodik, " Small languages in an undergraduate PL/Compiler course," *First SIGPLAN Workshop on Undergraduate Programming Language Curricula*, 43(11), pages 39-44, 2008.
7. Eric Allen, Mark W. Bailey, Rastislav Bodik, Kim B. Bruce, Kathleen Fisher, Stephen N. Freund, Robert Harper, Chandra Krintz, Shriram Krishnamurthi, James R. Larus, Doug Lea, Gary T. Leavens, Lori L. Pollock, Stuart Reges, Martin C. Rinard, Mark A. Sheldon, Franklyn A. Turbak, Mitchell Wand, " SIGPLAN programming language curriculum workshop: Discussion Summaries and recommendations," *SIGPLAN programming languages curriculum workshop*, 43(11), pages 6-29, 2008.
8. Min Xu, Rastislav Bodik, Mark D. Hill, " A Hardware Memory Race Recorder for Deterministic Replay," *IEEE Micro*, 27(1), pages 48-55, 2007.
9. Brian A. Fields, Rastislav Bodik, Mark D. Hill, Chris J. Newburn, " Interaction Cost: For When Event Counts Just Don't Add Up," *IEEE Micro Special Issue: Micro's Top Picks from Microarchitecture Conferences*, 24(6), pages 57-61, 2004.
10. Brian A. Fields, Rastislav Bodik, Mark D. Hill, Chris J. Newburn, " Interaction cost and shotgun profiling," *ACM Transactions on Architecture and Code Optimization*, 1(3), pages 272-304, 2004.

11. Rastislav Bodik, Rajiv Gupta, Mary Lou Soffa, "Complete removal of redundant expressions (with retrospective)," *20 Years of the ACM SIGPLAN Conference on Programming Language Design and Implementation 1979-1999, A Selection*, 1-58113-623-4, pages 596-611, 2004.
12. Rastislav Bodik, Rajiv Gupta, "Array Data-Flow Analysis for Load-Store Optimizations in Fine-Grain," *International Journal of Parallel Programming*, 24(6), pages 481-512, 1996.

### Refereed papers and presentations

1. Chenglong Wang, Alvin Cheung, Rastislav Bodik, "Speeding up Symbolic Reasoning for Relational Queries," *ACM SIGPLAN conference on Systems, Programming, Languages and Applications: Software for Humanity (OOPSLA)*, Nov 2018.
2. Phitchaya Mangpo Phothilimthana, Ming Liu, Antoine Kaufman, Simon Peter, Rastislav Bodik, Thomas Anderson, "Floem: Programming System for NIC-Accelerated Network Applications," *13th USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, Oct 2018.
3. Sarah Chasins, Maria Mueller, Rastislav Bodik, "Rousillon: Scraping Distributed Hierarchical Web Data," *31st ACM User Interface Software and Technology Symposium (UIST)*, Oct 2018.
4. Grigory Fedyukovich, Rastislav Bodik, "Accelerating Syntax-Guided Invariant Synthesis," *24th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, 251-269, Apr 2018.
5. Kartik Chandra and Rastislav Bodik, "Bonsai: Synthesis-Based Reasoning for Type Systems," *40th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)*, 282-316, Jan 2018.
6. Sarah Chasins, Rastislav Bodik, "Skip Blocks: Reusing Execution History to Accelerate Web Scripts," *26th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Oct 2017.
7. Grigory Fedyukovich, Maaz Bin Safeer Ahmad, Rastislav Bodik, "Gradual Synthesis for Static Parallelization of Single-Pass Array-Processing Programs," *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 572-585, July 2017.
8. Chenglong Wang, Alvin Cheung, Rastislav Bodik, "Synthesizing Highly Expressive SQL Queries from Input-Output Examples," *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, July 2017.
9. Grigory Fedyukovich, Samuel Kaufman, Rastislav Bodik, "Sampling Invariants from Frequency Distributions," *Formal Methods in Computer Aided Design (FMCAD)*, 100-107, Oct 2017.
10. Rastislav Bodik, Kartik Chandra, Phitchaya Mangpo Phothilimthana, Nathaniel Yazdani, "Domain-Specific Symbolic Compilation," *2nd Summit on Advances in Programming Languages*, May 2017.
11. Shaon Barman, Sarah Chasins, Ras Bodik, Sumit Gulwani, "Ringer: Web Automation by Demonstration," *26th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, Nov 2016.

12. Grigory Fedyukovich and Rastislav Bodik, "Approaching Symbolic Parallelization by Synthesis of Recurrence Decompositions," *Fifth Workshop on Synthesis*, 55-66, July 2016.
13. Yi Wu, Lei Li, Stuart Russell, Rastislav Bodik, "Swift: Compiled Inference for Probabilistic Programming Languages," *International Joint Conference on Artificial Intelligence*, New York City, July 2016.
14. Phitchaya Mangpo Phothilimthana, Michael Schuldt, Rastislav Bodik, "Compiling a Gesture Recognition Application for a Low-Power Spatial Architecture," *Languages, Compilers, Tools and Theory for Embedded Systems*, 1-11, Santa Barbara, California, June 2016.
15. Phitchaya Mangpo Phothilimthana, Aditya Thakur, Rastislav Bodik, and Dinakar Dhurjati, "Scaling up Superoptimization," *12th International Conference on Architectural Support for Programming Languages and Operating Systems*, April 2016.
16. Phitchaya Mangpo Phothilimthana, Aditya Thakur, Rastislav Bodik, and Dinakar Dhurjati, "GreenThumb: Superoptimizer Construction Framework," *Languages, Compilers, Tools and Theory for Embedded Systems*, Santa Barbara, California, March 2016.
17. Sarah Chasins, Shaon Barman, Sumit Gulwani, Rastislav Bodik, "Browser Record and Replay as a Building Block for End-User Web Automation Tools," *24th International World Wide Web Conference*, 1-4, Florence, Rome, May 2015.
18. Ali Sinan Köksal, Anthony Gitter, Kirsten Beck, Aaron McKenna, Saurabh Srivastava, Nir Piterman, Rastislav Bodik, Alejandro Wolf-Yadlin, Ernest Fraenkel, Jasmin Fisher, "Synthesizing signaling pathways from temporal phosphoproteomic data (refereed presentation)," *RECOMB/ISCB Conference on Regulatory and Systems Genomics, 2014*, n/a, San Diego, CA, Nov 2014.
19. Thibaud Hottelier, Rastislav Bodik, Kimiko Ryokai, "Programming by Manipulation for Layout," *ACM Symposium on User Interface Software and Technology (UIST)*, 1-11, Honolulu, Hawaii, USA, Oct 2014.
20. Joel Galenson, Rastislav Bodik, Koushik Sen, "CodeHint: Dynamic and Interactive Synthesis for Modern IDEs (refereed presentation)," *Future Programming, (FP)*, collocated at *SPLASH*, n/a, Portland, OR, Oct 2014.
21. Joel Galenson, Rastislav Bodik, Koushik Sen, "CodeHint: Dynamic and Interactive Synthesis for Modern IDEs (refereed presentation)," *Future Programming, (FP)*, collocated at *Strange Loop*, n/a, St. Louis, MO, Sep 2014.
22. Phitchaya Mangpo Phothilimthana, Tikhon Jelvis, Rohin Shah, Nishant Totla, Sarah Chasins, and Rastislav Bodik, "Chlorophyll: Synthesis-Aided Compiler for Low-Power Spatial Architectures," *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 396-407, Edinburgh, UK, Jun 2014.
23. Emina Torlak and Rastislav Bodik, "A Lightweight Symbolic Virtual Machine for Solver-Aided Host Languages," *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 530-541, Edinburgh, UK, Jun 2014.
24. Joel Galenson, Philip Reames, Rastislav Bodik, Björn Hartmann, and Koushik Sen, "CodeHint: Dynamic and Interactive Synthesis of Code Snippets," *36th International Conference on Software Engineering (ICSE)*, 653-663, Hyderabad, May 2014.
25. Emina Torlak and Rastislav Bodik, "Growing Solver-Aided Languages with Rosette," *Symposium on New Ideas in Programming and Reflections on Software (Onward! 2013)*, 135-152, Portland, OR, Oct 2013.

26. Joel Galenson, Philip Reames, Rastislav Bodik, and Koushik Sen, "CodeHint: Lightweight and Interactive Synthesis for modern IDEs," *First International Workshop on Live Programming (LIVE)*, San Francisco, 2013, May 2013.
27. Leo A. Meyerovich, Matthew E. Torok, Eric Atkinson, Rastislav Bodik., "Superconductor: A Language for Big Data Visualization.," *Workshop on Leveraging Abstractions and Semantics in High-performance Computing (LASH-C)*, Shenzhen, China, Feb 2013.
28. Leo A. Meyerovich, Matthew E. Torok, Eric Atkinson, Rastislav Bodik, "Parallel Schedule Synthesis for Attribute Grammars," *18th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, 187-196, Shenzhen, China, Feb 2013.
29. Saurabh Srivastava et al, "Biochemistry as a Programming Language," *Off The Beaten Track: New Frontiers for Programming Languages Research*, Rome, Italy (colocated with POPL 2013), Jan 2013.
30. Ali Sinan Köksal, Yewen Pu, Saurabh Srivastava, Rastislav Bodik, Jasmin Fisher, Nir Piterman, "Synthesis of Biological Models from Mutation Experiments," *40th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)*, 469-482, Rome, Italy, Jan 2013.
31. Yewen Pu, Saurabh Srivastava, Rastislav Bodik, "Synthesis of First-Order Dynamic Programming Algorithms," *26th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*, 83-98, Tuscon, AZ, Oct 2011.
32. Shaon Barman, Rastislav Bodik, Sagar Jain, Yewen Pu, Saurabh Srivastava, Nicholas Tung, "Parallel Programming with Inductive Synthesis," *3rd Usenix Workshop on Hot Topics in Parallelism (HotPar)*, 1-5, Berkeley, CA, May 2011.
33. Satish Chandra, Emina Torlak, Shaon Barman, Rastislav Bodik, "Angelic debugging," *International Conference on Software Engineering (ICSE)*, 121-130, Waikiki, Honolulu, HI, May 2011.
34. Gilad Arnold, Johannes Hölzl, Ali Sinan Köksal, Rastislav Bodik, Mooly Sagiv, "Specifying and verifying sparse matrix codes," *The 15th ACM SIGPLAN International Conference on Functional Programming (ICFP)*, 249-260, Baltimore, MD, Sep 2010.
35. Rastislav Bodik, Satish Chandra, Joel Galenson, Doug Kimelman, Nicholas Tung, Shaon Barman, Casey Rodarmor, "Programming with angelic nondeterminism," *Symposium on Principles of Programming Languages (POPL)*, 339-352, Madrid, Spain, Jan 2010.
36. Shay Litvak, Nurit Dor, Rastislav Bodik, Noam Rinetzky, Mooly Sagiv, "Field-sensitive program dependence analysis," *Eighteenth International Symposium on the Foundations of Software Engineering (FSE)*, 287-296, Santa Fe, NM, Nov 2010.
37. Leo A. Meyerovich, Rastislav Bodik, "Fast and parallel webpage layout," *International World Wide Web Conferences (WWW)*, 711-720, Raleigh, NC, Apr 2010.
38. Andreas Raabe, Rastislav Bodik, "Synthesizing hardware from sketches," *Wild and Crazy Ideas*, 623-624, San Francisco, CA, Jul 2009.
39. Rastislav Bodik, Justin Bonnar, Doug Kimelman, "Can Computers be Programmed Productively in the Post-Dividend Era?," *PLDI Fun Ideas and Thoughts*, 1-2, Dublin, Ireland, Jun 2009.
40. James Ide, Rastislav Bodik, Doug Kimelman, "Concurrency Concerns in Rich Internet Applications," *Exploiting Concurrency Efficiently and Correctly, a CAV workshop*, 1-4, Grenoble, France, Jun 2009.

41. Chris Jones, Rose Liu, Leo Meyerovich, Krste Asanovic, Rastislav Bodik, "Parallelizing the Web Browser," *USENIX Workshop on Hot Topics in Parallelism*, 1-6, Berkeley, CA, Jan 2009.
42. Ajeet Shankar, Matthew Arnold, Rastislav Bodik, "Jolt: lightweight dynamic analysis and removal of object churn," *ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications*, 127-142, Nashville, TN, Oct 2008.
43. Armando Solar-Lezama, Christopher Grant Jones, Rastislav Bodik, "Sketching concurrent data structures," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 136-148, Tuscon, AZ, Jun 2008.
44. Satish Chandra, Vijay A. Saraswat, Vivek Sarkar, Rastislav Bodik, "Type inference for locality analysis of distributed data structures," *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, 11-22, Salt Lake City, UT, Feb 2008.
45. Manu Sridharan, Stephen J. Fink, Rastislav Bodik, "Thin slicing," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 112-122, San Diego, CA, Jun 2007.
46. Armando Solar-Lezama, Gilad Arnold, Liviu Tancau, Rastislav Bodik, Vijay A. Saraswat, Sanjit A. Seshia, "Sketching stencils," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 167-178, San Diego, CA, Jun 2007.
47. Ajeet Shankar, Rastislav Bodik, "DITTO: automatic incrementalization of data structure invariant checks (in Java)," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 310-319, San Diego, CA, Jun 2007.
48. Armando Solar-Lezama, Liviu Tancau, Rastislav Bodik, Sanjit A. Seshia, Vijay A. Saraswat, "Combinatorial sketching for finite programs," *12th International Conference on Architectural Support for Programming Languages and Operating Systems*, 404-415, San Jose, CA, Oct 2006.
49. Min Xu, Mark D. Hill, Rastislav Bodik, "A regulated transitive reduction (RTR) for longer memory race recording," *12th International Conference on Architectural Support for Programming Languages and Operating Systems*, 49-60, San Jose, CA, Oct 2006.
50. Manu Sridharan, Rastislav Bodik, "Refinement-based context-sensitive points-to analysis for Java," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 387-400, Ottawa, Canada, Jun 2006.
51. Ajeet Shankar, S. Subramanya Sastry, Rastislav Bodik, James E. Smith, "Runtime specialization with optimistic heap analysis," *20th Annual ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*, 327-343, San Diego, CA, Oct 2005.
52. Manu Sridharan, Denis Gopan, Lexin Shan, Rastislav Bodik, "Demand-driven points-to analysis for Java," *Annual ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*, 59-76, San Diego, CA, Oct 2005.
53. Min Xu, Rastislav Bodik, Mark D. Hill, "A serializability violation detector for shared-memory server programs," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 1-14, Chicago, IL, Jun 2005.
54. Armando Solar-Lezama, Rodric M. Rabbah, Rastislav Bodik, Kemal Ebcioglu, "Programming by sketching for bit-streaming programs," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 281-294, Chicago, IL, Jun 2005.

55. David Mandelin, Lin Xu, Rastislav Bodik, Doug Kimelman, "Jungloid mining: helping to navigate the API jungle," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 48-61, Chicago, IL, Jun 2005.
56. Armando Solar-Lezama, Rastislav Bodik, "Templating Transformations for Bitstream Programs," *HPCA Workshop on Productivity and Performance in High-End Computing (P-PHEC 2004)*, 27-39, Madrid, Spain, 2004.
57. Min Xu, Rastislav Bodik, Mark D. Hill, "A "Flight Data Recorder" for Enabling Full-System Multiprocessor Deterministic Replay," *ACM SIGARCH 30th Annual International Symposium on Computer Architecture*, 122-133, San Diego, CA, 2003.
58. Brian A. Fields, Rastislav Bodik, Mark D. Hill, Chris J. Newburn, "Using Interaction Costs for Microarchitectural Bottleneck Analysis," *The 36th Annual IEEE/ACM International Symposium on Microarchitecture*, 228-242, San Diego, CA, 2003.
59. Glenn Ammons, David Mandelin, Rastislav Bodik, James R. Larus, "Debugging temporal specifications with concept analysis," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 182-195, San Diego, CA, 2003.
60. Brian A. Fields, Rastislav Bodik, Mark D. Hill, "Slack: Maximizing Performance Under Technological Constraints," *ACM SIGARCH 29th Annual International Symposium on Computer Architecture*, 47-58, Anchorage, AK, 2002.
61. Shai Rubin, Rastislav Bodik, Trishul M. Chilimbi, "An efficient profile-analysis framework for data-layout optimizations," *ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, 140-153, Portland, OR, 2002.
62. Glenn Ammons, Rastislav Bodik, James R. Larus, "Mining specifications," *ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, 4-16, Portland, OR, 2002.
63. S. Subramanya Sastry, Rastislav Bodik, James E. Smith, "Rapid profiling via stratified sampling," *ACM SIGARCH 28th Annual International Symposium on Computer Architecture*, 278-289, Göteborg, Sweden, 2001.
64. Brian A. Fields, Shai Rubin, Rastislav Bodik, "Focusing processor policies via critical-path prediction," *ACM SIGARCH 28th Annual International Symposium on Computer Architecture*, 74-85, Göteborg, Sweden, 2001.
65. Rastislav Bodik, Rajiv Gupta, Vivek Sarkar, "ABCD: eliminating array bounds checks on demand," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 321-333, Vancouver, Canada, 2000.
66. Subbu Sastry, Rastislav Bodik, James E. Smith, "Characterizing Coarse-Grain Reuse of Computations," *Proc. 3rd ACM Workshop on Feedback-Directed and Dynamic Optimization (FDDO-3)*, 1-10, Monterrey, CA, 2000.
67. Rajiv Gupta, Rastislav Bodik, "Register Pressure Sensitive Redundancy Elimination," *International Conference on Compiler Construction*, 107-121, Amsterdam, Netherlands, 1999.
68. Rastislav Bodik, Rajiv Gupta, Mary Lou Soffa, "Load-Reuse Analysis: Design and Evaluation," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 64-76, Atlanta, GA, 1999.
69. Rastislav Bodik, Rajiv Gupta, Mary Lou Soffa, "Complete Removal of Redundant Computations," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 1-14, Montreal, Canada, 1998.

70. Rastislav Bodik, Sadun Anik, "Path-Sensitive Value-Flow Analysis," *ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, 237-251, San Diego, CA, 1998.
71. Rastislav Bodik, Rajiv Gupta, Mary Lou Soffa, "Refining Data Flow Information Using Infeasible Paths," *ACM SIGSOFT Symposium on Foundations of Software Engineering*, 361-377, Zurich, Switzerland, 1997.
72. Rastislav Bodik, Rajiv Gupta, Mary Lou Soffa, "Interprocedural Conditional Branch Elimination," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 146-158, Las Vegas, NV, 1997.
73. Rastislav Bodik, Rajiv Gupta, "Partial Dead Code Elimination using Slicing Transformations," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, 159-170, Las Vegas, NV, 1997.
74. Rajiv Gupta, Rastislav Bodik, "Adaptive Loop Transformations for Scientific Programs," *IEEE Symposium on Parallel and Distributed Processing*, 368-375, San Antonio, TX, 1995.
75. Rastislav Bodik, Rajiv Gupta, "Array Data-Flow Analysis for Load-Store Optimizations in Superscalar Architectures," *The Eighth Annual Workshop on Languages and Compilers for Parallel Computing*, 1-15, Columbus, OH, 1995.

#### **Non-refereed papers and presentations**

1. Rajeev Alur, Rastislav Bodik, Garvit Juniwal, Milo Martin, Mukund Raghothman, Sanjit Seshia, Rishabh Singh, Armando Solar-Lezama, Emina Torlak, and Abhsihek Udupa, "Syntax-Guided Synthesis (Tutorial)," *Formal Methods in Computer-Aided Design (FMCAD)*, 1-17, Portland, OR, Oct 2013.
2. Rastislav Bodik and Barbara Jobstmann, "Algorithmic Program Synthesis: Guest Editors' Introduction," *International Journal on Software Tools for Technology Transfer*, 397-411, Aug 2013.
3. Rastislav Bodik, "Parallelizing the Browser (Chapter 2)," *Retrospective, in The Berkeley Par Lab: Progress in the Parallel Computing Landscape*, David Patterson, Dennis Gannon, Michael Wrinn, ed., Jun 2013.
4. Rastislav Bodik, "Algorithmic Program Synthesis (Chapter 14)," *Retrospective, in The Berkeley Par Lab: Progress in the Parallel Computing Landscape*, David Patterson, Dennis Gannon, Michael Wrinn, ed., Jun 2013.
5. Edward Lu and Rastislav Bodik, "Quicksilver: Automatic Synthesis of Relational Queries," *University of California, Berkeley, Technical Report No. UCB/EECS-2013-68*, May 2013.
6. Rastislav Bodik, "Compiling What to How (Overview for Kuncak et al CACM Research Highlight paper "Software Synthesis Procedures")," *Communications of the ACM*, 102-102, Apr 2012.
7. Thibaud Hottelier, James Ide, Doug Kimelman, Rastislav Bodik, "Parallel Web Scripting with Reactive Constraints," 1-9, Feb 2010.
8. Rastislav Bodik, "Software synthesis with sketching," *ACM SIGPLAN 2008 Workshop on Partial Evaluation and Program Manipulation (PEPM '08)*, 1-2, San Francisco, CA, Jan 2008.

9. Eric Allen, Mark W. Bailey, Rastislav Bodik, Kim B. Bruce, Kathleen Fisher, Stephen N. Freund, Robert Harper, Chandra Krintz, Shriram Krishnamurthi, James R. Larus, Doug Lea, Gary T. Leavens, Lori L. Pollock, Stuart Reges, Martin C. Rinard, Mark A. Sheldon, Franklyn A. Turbak, Mitchell Wand, "SIGPLAN programming language curriculum workshop: Discussion Summaries and recommendations," *SIGPLAN programming languages curriculum workshop*, 6-29, Nov 2008.
10. Rastislav Bodik, "Path-Sensitive Value-Flow Optimizations of Programs,," *PhD Thesis*, 1-150, University of Pittsburgh, 1999.

## GRANTS

- PI, *CAPA: Collaborative Research: ARION: Taming Heterogeneity with DSLs, Approximation, and Synthesis*, Intel, gift, 2017-2020, \$850,000.
- PI, *CAPA: Collaborative Research: ARION: Taming Heterogeneity with DSLs, Approximation, and Synthesis*, NSF, CCF-1723352, 2017-2020, \$850,000.
- PI, *A Picture is Worth a Billion Bits: Adaptive Visualization of Big Data*, DARPA, FA8750-16-2-0032, 2015-2019, \$7,522,786.
- PI, *SI2-SSE, Algorithms and Tools for Data-Driven Executable Biology*, NSF, ACT-1535191, 2015-2018, \$499,784.
- Co-PI, *Automated Probabilistic Programming Representation and Inference Languages*, DARPA, PPAML Program, 2013-2017, \$1,369,735.
- PI, *XPS: FP: Program Synthesis for Low-Power Spatial Architectures*, NSF, CCF-1337415, 2013-2016, \$749,877.
- PI, *Collaborative Research: Expeditions in Computer Augmented Program Engineering (ExCAPE): Harnessing Synthesis for Software Design*, NSF, CCF-1138996, 2012-2017, \$3,478,442.
- Co-PI, *DSL Technology for Exascale Computing (D-TEC)*, DOE, DE-SC0008923, 2012-2015, \$11,605,314.
- PI, *HW Accelerated Data Visualization on Tizen*, Samsung Electronics, contract, 2012-2013, \$126,086.
- PI, *Computed Aided Development for Mobile Applications*, Samsung Electronics, contract, 2012-2013, \$126,086.
- co-Investigator, *Synthesis of Enzymatic Pathways with the Act Ontology*, DARPA, Living Foundries BAA-11-60, 2012-2014, \$585,170.
- co-Investigator, *Universal Parallel Computing Research Center (Phase II)*, Microsoft/Intel, research contract, 2011-2013, \$4,000,000.
- PI, *Software Synthesis for High Productivity Exascale Computing*, DOE, DE-SC0005136, 2010-2014, \$683,344.
- co-PI, *CIFellows Project: Postdoc Fellowship for Saurabh Srivastava*, Computing Research Association, CIF-B-106, 2010-2012, \$267,500.
- PI, *Software Synthesis for High Productivity Exascale Computing*, DOE, DE-SC0005136, 2010-2013, \$683,344.
- co-Investigator, *Universal Parallel Computing Research Center*, University of California, Discovery, 2010-2011, \$1,125,000.

- PI, *Web Page Layout and Animations for Handheld Devices*, Nokia, Inc 20093333, 2009-2011, \$156,000.
- mentor, *Parallel Web Browser Algorithms*, Qualcomm, Innovation Fellowship for Seth Fowler and Leo Meyerovich, 2009-2010, \$100,000.
- co-PI, *Universal Parallel Computing Research Center*, Samsung, ParLab industrial affiliate donation, 2009-2011, \$300,000.
- co-PI, *Universal Parallel Computing Research Center*, Nokia, ParLab industrial affiliate donation, 2009-2011, \$300,000.
- PI, *SHF: Small: Programming Abstractions for Algorithmic Software Synthesis*, NSF, CCF-0916351, 2009-2012, \$500,000.
- co-Investigator, *Universal Parallel Computing Research Center*, University of California, Discovery, 2008-2010, \$2,397,390.
- co-Investigator, *Universal Parallel Computing Research Center*, Microsoft/Intel, research contract, 2008-2011, \$6,000,000.
- PI, *Programming by Sketching*, University of California, MICRO, 2007-2008, \$83,375.
- PI, *Programming by Sketching*, IBM, COR, 2006-2008, \$500,000.
- PI, *SoD-TEAM: Programming by Sketching*, NSF, CCF-0613997, 2006-2008, \$200,000.
- PI, *Programming by Sketching*, University of California, MICRO, 2006-2007, \$112,350.
- PI, *CyberTrust-ISG: Implementing Provably Correct High-Performance Ciphers with Sketching*, NSF, CNS-0524815, 2005-2008, \$450,000.
- PI, Microsoft, donation, 2005-2006, \$37,000.
- PI, Intel, research grant, 2005-2006, \$20,000.
- PI, IBM, Eclipse Innovation Grant, 2005-2006.
- co-PI, *Tools for Securing Software Infrastructure*, University of California, MICRO, 2004-2005.
- PI, Intel, research grant, 2004-2005.
- PI, *Prospector*, IBM, Eclipse Innovation Grant, 2004-2005.
- PI, *PERCS (Productive, Easy-to-use, Reliable Computing System)*, DARPA, HPCS Phase II, 2003-2005, \$240,000.
- Co-PI, *ITR: Language-Based Software Security*, NSF, CNS-0326577, 2003-2007, \$900,000.
- Co-PI, *Tools for Securing Software Infrastructure*, University of California, MICRO, 2003-2004, \$53,543.
- PI, Intel, research grant, 2003-2004.
- PI, IBM, Faculty Partnership Award, 2003-2004.
- Co-PI, *Exploiting the Critical Path in the Design*, NSF, CCR-0105721, 2001-2004, \$422,507.
- Co-PI, *NGS: Wisconsin DOVE: Distributed Optimizing Virtual Environment*, NSF, EIA-0103670, 2001-2004, \$596,740.
- PI, *CAREER: Scalable Compiler Optimizations for Modern Software*, NSF, CCR-0093275, 2000-2005, \$300,000.

## GIFTS

- PI, *Code Generation for Vector and Stream Processors*, Qualcomm, 2014, \$50,000.
- PI, *Web Browsers: Parallelization and End-User Programming*, Google, 2014, \$62,000.
- PI, *Parallel Layout Engine for the Mozilla Servo Browser*, Intel, 2014, \$75,000.
- PI, *HTML5 Research*, Mozilla, 2013, \$150,000.
- PI, *Parallel Web Browsers*, Nokia, 2013, \$150,000.
- PI, *Parallel Layout Engine for the Mozilla Servo Browser*, Intel, 2013, \$75,000.
- PI, *Layout and Scripting Language for Parallel Clients*, Google, 2011, \$70,000.
- PI, *Live Tiles from User Mockups*, Nokia, 2011, \$60,000.
- PI, Microsoft, 2005, \$37,000.
- PI, Intel, 2005, \$20,000.
- PI, IBM, 2005.
- PI, Intel, 2004.
- PI, *Prospector*, IBM, 2004.
- PI, Intel, 2003.

## RECENT SEMINARS

- talk, *Programmer Productivity in a World of Mushy Interfaces: Challenges of the Post-ISA Reality*, Panel at ASPLOS 2016 21st ACM International Conference on Architectural Support for Programming Languages and Operating Systems: The Last Panel on ISAs, Atlanta, GA, April 2016.
- invited talk, *Irrational Rationale Capture: Scaling Up Programmer's Apprentice While Holding Your Nose*, NDIST 2014: New Directions in Software Technology, Caneel Bay, St. John, December 2014.
- invited talk, *Survivalist Programming Models and Compilation*, ISAT Survivalist Computing and Communications Study, Warrenton, VA, August 2014.
- keynote, *Faster, Higher-Level, Stronger: Programming with Solver-Aided Languages*, ISSTA Doctoral Symposium, San Jose, CA, July 2014.
- invited talk, *Constructing programming models and compilers for minimalistic low-power architectures*, Ultra-Low Power Computing Workshop 2014, Redmond, WA, July 2014.
- invited talk, *Synthesizing Web Browser Layout Engines*, Seminar for Servo Browser Developers, Mozilla, San Francisco, CA, July 2014.
- invited talk, *Adventures in Program Synthesis from synthesis to solver-aided languages*, Seminar, MPI-SW, Saarbrücken, Germany, May 2014.
- seminar, *Modeling Biology with Solver-Aided Languages*, Seminar, EPFL, Lausanne, Switzerland, May 2014.
- retreat, *Overview of Program Synthesis Research at UC Berkeley*, Chaperone Project Retreat, Santa Cruz, CA, May 2014.
- talk, *Synthesizing Inference Solvers with Partial Evaluation*, Onsite review for DARPA PPAML, Cambridge, MA, April 2014.

- invited talk, *Update on Berkeley HTML5 Research*, SSG Research Program Review , Santa Clara, CA, March 2014.
- invited talk, *HW Accelerated Data Visualization on Tizen*, Research Review, Samsung, Santa Clara, CA, March 2014.
- invited talk, *Computed Aided Development for Mobile Applications*, Research Review, Samsung, Santa Clara, CA, March 2014.
- seminar, *Design Methodology*, NSF Expedition PI Onsite visit , Berkeley, CA, March 2014.
- invited talk, *Modeling Biology by Synthesizing Programs*, DARPA Living Foundries Meeting, La Jolla, CA, January 2014.
- invited talk, *Modeling Biology with Solver-Aided Languages*, NDIIST 2013: Software Technologies for Synthetic Biology, Caneel Bay, St. John, December 2013.
- invited talk, *Designers and End Users in k Years*, Mozilla Internet Futures Workshop , San Francisco, CA, November 2013.
- invited talk, *Parallelizing the Web Browser and Other Browser Research at UC Berkeley*, Seminar, Google, Mountain View, CA, November 2013.
- keynote, *Modeling Biology with Solver-Aided Programming Languages*, 12th International Conference on Generative Programming: Concepts and Experiences (GPCE'13), Indianapolis, IN, October 2013.
- distinguished talk, *Modeling Biology With Solver-Aided Programming Languages*, University of Wisconsin, Computer Sciences, Distinguished Lecture Series, Madison, WI, October 2013.
- Colloquium , *Adventures in Program Synthesis recent lessons and a look into the next decade*, EPFL, Lausanne, Switzerland, September 2013.
- invited talk, *Why Parallel Web Browsers?*, The 26th International Workshop on Languages and Compilers for Parallel Computing (LCPC), Santa Clara, CA, September 2013.
- invited talk, *Why Parallel Web Browsers?*, Nokia Architecture and Technology Conference , Sunnyvale, CA, August 2013.
- presentation, *Solver-Aided Languages*, ExCape Expedition review, UPenn, Philadelphia, PA, August 2013.
- tutorial , *Solver-Aided Languages*, The Summer School of the ExCape NSF Expedition Project, Berkeley, CA, June 2013.
- invited talk, *Modeling Biology With Solver-Aided Programming Languages*, PL Seminar, UCLA, Los Angeles, CA, June 2013.
- talk, *Overview of browser research*, Nokia, Nokia, Sunnyvale, CA, May 2013.
- talk, *Spectral Analysis of ASPLOS*, ASPLOS PC Chair Presentation , Houston, TX, March 2013.
- talk, *Programming by Demonstration for Browsers*, Intel SSG Seminar, Intel, Santa Clara, CA, January 2013.
- invited talk, *Program Synthesis for Low-Power Accelerators*, Architecture Seminar, Qualcomm, San Diego, CA, December 2012.

- invited tutorial (with Emina Torlak), *Synthesizing Programs with Constraint Solvers*, CAV 2012, Berkeley, CA, July 2012.
- invited talk, *Synthesis for Systems Biology*, SYNT 2012: The First Workshop on Synthesis (at CAV 2012), Berkeley, CA, July 2012.
- workshop presentation, *Parallel Client Programmable by Everyone*, Computer Systems Design for the 21st Century (ASPLOS 2011 PC Workshop), Rochester, NY, October 2011.
- seminar, *Algorithmic Program Synthesis*, Microsoft Research, Cambridge, UK, September 2011.
- invited talk, *Automatic Programming Revisited, Part I: Puzzles and Oracles*, ARTIST Summer School Europe 2011, Aix-les-Bains, France, September 2011.
- invited talk, , *Part II: Synthesizer Algorithms*, ARTIST Summer School Europe 2011, Aix-les-Bains, France, September 2011.
- invited talk, *Sketching: Partial Programs, Inductive Synthesis and Constraint Solvers*, 4th International Workshop on Approaches and Applications of Inductive Programming, Odense, Denmark, July 2011.
- invited panel presentation , *Hack Your Language!*, Teaching Programming Language Design and Implementation ... What? to Whom? How? (PLDI 2011 panel), San Jose, CA, June 2011.
- workshop presentation, *Parallel Programming with Inductive Synthesis*, 3rd USENIX Workshop on Hot Topics in Parallelism (HotPar), Berkeley, CA, May 2011.
- invited talk, *Ideas for Applying Synthesis to High-Performance Computing*, DARPA ISAT Workshop, Chicago, IL, May 2011.
- invited talk, *Automatic Programming Revisited*, Triangle Computer Science Distinguished Lecturer Series, NCSU, March 2011.
- invited talk, *Algorithmic Program Synthesis with Partial Programs*, CIS Colloquium 2009, University of Pennsylvania, PA, October 2009.
- invited talk, *Synthesizing Programs from Programmer Insight*, Future of Design of Software Development (NPUC 2009), Almaden, CA, July 2009.
- invited talk, *Algorithmic Program Synthesis with Partial Programs and Decision Procedures*, The 16th International Static Analysis Symposium (SAS 2009), Los Angeles, CA, August 2009.
- invited lectures, *Algorithmic Program Synthesis*, Oregon Summer School in Programming Languages, Eugene, OR, July 2009.
- invited talk, *Program Synthesis by Sketching*, 7th meeting of IFIP Working Group 2.11, NASA Ames, April 2009.
- invited lecture, *Program Synthesis by Sketching*, Computer Science Lecture Series, Rice University, October 2008.
- invited talk, *Exploiting Parallelism in the Web Browser*, Browser Performance Workshop, Santa Clara, CA, August 2008.
- seminar, *Recent Results in Sketching Synthesis*, IBM Watson PL Seminar, Hawthorne, NY, August 2008.

- invited talk, *Sketching Concurrent Data Structures*, UW/MSR Workshop on The Concurrency Challenge, Blaine, WA, August 2008.
- invited talk, *Browsing Web 3.0 on 3.0 Watts: Why Browsers Will Be Parallel and Implications for Education*, The 3rd Workshop on Software Tools for MultiCore Systems (STMCS08), Boston, MA, April 2008.
- plenary talk, *Program Synthesis by Sketching*, The 4th Annual Thomas J. Watson P=ac2 Conference, Yorktown Heights, NY, April 2008.
- panel presentation, *Why Do We Still Have Bugs?*, The 4th Annual Thomas J. Watson P=ac2 Conference, Yorktown Heights, NY, March 2008.
- invited talk, *Browsing Web 3.0 on 3.0 Watts: Why Browsers Will Be Parallel*, Mozilla Corp Engineering All-Hands Week, Menlo Park, CA, January 2008.
- invited talk, *Program Synthesis by Sketching*, ACM SIGPLAN 2008 Workshop on Partial Evaluation and Program Manipulation (PEPM08), San Francisco, CA, January 2008.
- invited talk, *Programming by Sketching*, Computer Science Colloquium, Cornell University, October 2007.
- invited talk, *Programming by Sketching*, New England Programming Languages and Systems Symposium (NEPLS), Portland, Maine, October 2006.
- invited talk, *Two Techniques for Programming by Sketching*, Computer Science Colloquium, Brown University, October 2006.

## STUDENTS, GRADUATED

- Subbu Sastry, *PhD* (University of Wisconsin), 2003, *Techniques for Transparent Program Specialization In Dynamic Optimizers*, co-advised with Jim Smith.
- Glenn Ammons, *PhD* (University of Wisconsin), 2003, *Strauss: A Specification Miner*, co-advised with Jim Larus, now at IBM Research.
- Min Xu, *PhD* (University of Wisconsin), 2006, *Race Recording for Multithreaded Deterministic Replay Using Multiprocessor Hardware*, co-advised with Mark Hill, now at SeaMicro.
- Brian Fields, *PhD*, 2006, *Using Criticality to Attack Performance Bottlenecks*, winner of NSF Fellowship, now at Webroot Software.
- Manu Sridharan, *PhD*, 2007, *Refinement-Based Program Analysis Tools*, winner of Microsoft Fellowship, NDSEG Fellowship, now at IBM Research.
- A.J. Shankar, *PhD*, 2007, *Complex Program Transformations Via Simple Online Dynamic Analyses*, winner of NDSEG Fellowship, now at modista, EasyESI.
- David Mandelin, *MS*, 2007, *Prospector*, now at Mozilla.
- Armando Solar-Lezama, *PhD*, 2008, *Program Synthesis by Sketching*, winner of IBM Fellowship, now at MIT.
- Liviu Tancau, *MS*, 2007, *JavaSketch*, now at Google.
- Lexin Shan, *MS*, 2009, *SMT-based Sketch Synthesizer*.
- Chris Jones, *BS*, 2008, *Parallel lexical analysis*, winner of 2008 CRA Honorable Mention, now at Mozilla.
- Justin Bonnar, *BS*, 2009, *Attribute grammar scheduler*, now at Amazon.

- Seth Fowler, *MS*, 2011, *Divide-and-Conquer Parsing for Parallelism and Laziness*, winner of Qualcomm Fellowship, now at Qualcomm Research Center.
- Adam Jiang, *MS*, 2011, *Attribute grammar scheduler for parallel layout engines*, now at Oracle.
- James Ide, *BS*, 2011, *A declarative layout and animation language*, now at Facebook.
- Apollo Ellis, *BS*, 2008, *Parallel raytracing*, now at UT Austin (grad student); Intel.
- Gilad Arnold, *PhD*, 2011, *Data-Parallel Language for Correct and Efficient Sparse Matrix Codes*, now at Google.
- Sagar Jain, *MS*, 2011, *Program Synthesis of Parallel Scans*, now at Google.
- Nicholas Tung, *BS*, 2012, *Synthesis for GPUs*.
- Evan Pu, *BS*, 2011, *Synthesis of dynamic programming algorithms*, co-advised with Saurabh Srivastava, now at MIT (grad student).
- Edward Lu, *MS*, 2013, *Synthesis of relational queries*, now at Google.
- Matt Torok, *BS*, 2013, *Superconductor: Data visualization layout on GPU*, now at Graphistry.
- Leo Meyerovich, *PhD*, 2013, *Parallel layout engines and expressing layout semantics*, winner of NSF Fellowship, Qualcomm Fellowship, CRA Honorable Mention, now at Graphistry.
- Joel Galenson, *PhD*, 2014, *CodeHint*, co-advised with Koushik Sen, now at Qualcomm BARD; Google.
- Thibaud Hottelier, *PhD*, 2014, *Mud: declarative layout language with a synthesis-based compiler*, now at Graphistry.
- Saurabh Srivastava, *researcher*, 2014, *Synthesis for synthetic biology*, winner of CIFellowship, now at 20n; Synthetic Minds.
- Emina Torlak, *researcher*, 2014, *Solver-Aided Languages and Symbolic Virtual Machines*, now at University of Washington.
- Shaon Barman, *PhD*, 2015, *Programming by demonstration for web browser users*.
- Ali Sinan Koksai, *PhD*, 2017, *Modeling biology with solver-aided languages*, co-advised with Jasmin Fisher, Nir Piterman, now at Google.
- Phitchaya (Mangpo) Phothilimthana, *PhD*, 2018, *Synthesis-aided compiler for ultra-low-power manycores*, winner of Qualcomm Innovation Fellowship; MSR Fellowship, now at Google Brain Research.
- Eric Atkinson, *BS*, 2015, *Synthesis of parallel layout engines*, now at MIT.
- Rohin Shah, *BS*, 2016, *Automatic Specialization of Inference Algorithms*, now at UC Berkeley.
- Chenyang Yuan, *BS*, 2016, *Synthesis Engines*.
- Kartik Chandra, *High School*, , , now at Stanford.

## STUDENTS, CURRENT

- Sarah Chasins, *PhD*, expected graduation: 2019, topic: *Web scraping by demonstration*, winner of NSF Graduate Research Fellowship; ARCS Fellowship for Graduate Study.
- Julie Newcomb, *PhD*, expected graduation: 2020, topic: *Creating a DSL to define hints for student homework problems on DEAs*.

- Chenglong Wang, *PhD*, expected graduation: 2020, topic: *PBD for data analysis* , co-advised with Alvin Cheung.
- Sam Elliott, *PhD*, expected graduation: 2020, topic: *Synthesis for spatial architectures* .
- Sam Kaufman, *PhD* , expected graduation: 2020, topic: *ML + PLSE*.
- Sumith Kulal, *BS*, expected graduation: , topic: .

## PROFESSIONAL ACTIVITIES

### Organizer/Co-organizer

- XPS Workshop Steering Committee, Member, , Arlington, VA.
- POPL 2016, General Chair, .
- POPL Steering Committee, Member, .
- SNAPL: Symposium on Advances in Programming Languages, Co-Founder, .
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- ASPLOS 2013, Program Chair, , Houston, TX.
- ASPLOS Steering Committee, Member, .
- Executive Committee, NSF Expedition on Computing on Computer-Aided Programming, Member, .
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- Dagstuhl Seminar on Software Synthesis, co-organizer, , Dagstuhl, Germany.
- Summer School on Software Synthesis, co-organizer, , Dagstuhl, Germany.
- STTT Journal Special Issue on Synthesis, guest co-editor, .
- ASPLOS Special Session on Ideas and Perspectives, chair, , Newport Beach, California.
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- Prospective Grad Student Visit Day, co-organizer, , Berkeley, CA.
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- Prospective Grad Students Visit Day, co-organizer, , Berkeley, CA.
- Tapia Diversity in Computing Visit to Computer Science at UC Berkeley, co-organizer, , Berkeley, CA.
- Dagstuhl Seminar on Software Synthesis, co-organizer, , Dagstuhl, Germany.
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.

- The Annual Retreat of the UC Berkeley Programming Languages Area, Santa Cruz, CA, UC Berkeley, co-organizer, , Santa Cruz, CA.
- ASPLOS, Workshop Chair, .
- Compiler Construction (CC), Program Chair, .
- Student Research Forum at ACM SIGPLAN PLDI, Chair, .
- PACT, Publications Chair, .
- Steering Committee of European Joint Conferences on Theory and Practice of Software (ETAPS), Member, .
- Compiler Construction (CC) (04/2004 - 04/2005), Edinburgh, Scotland, European Joint Conferences on Theory and Practice of Software (ETAPS), Chair, , Edinburgh, Scotland.
- Wild and Crazy Ideas Session at ASPLOS, Co-chair, .
- Student Research Forum at PLDI, Co-chair, .
- The First ACM OM: Workshop on Optimizing Middleware and Distributed Software, Program Chair, .

### **Program Committee Member**

- Generative Programming and Component Engineering, (GPCE ), 2016
- ACM SIGPLAN Conference of Programming Language Design and Implementation (External Program Committee), (PLDI ), 2016
- ACM SIGPLAN Conference of Programming Language Design and Implementation (External Review Committee), (PLDI), 2015
- ACM SIGPLAN Conference of Programming Language Design and Implementation (External Review Committee), (PLDI), 2014
- SYNT 2013: 2nd Workshop on Synthesis, (SYNT), 2013
- ESEC/FSE 2013 New Ideas Track PC, (ESEC/FSE New Ideas), 2013
- SPLASH: Systems, Programming, Languages and Applications: Software for Humanity. , (OOPSLA (external program committee)), 2012
- 1st CAV Workshop on Synthesis, (SYNT), 2012
- 21st International Conference on Compiler Construction, (CC), 2012
- 17th ACM SIGARCH, SIGOPS, and SIGPLAN International Conference on Architectural Support for Programming Languages and Operating Systems, (ASPLOS ), 2012
- Generative Programming and Component Engineering, (GPCE), 2011
- SIGPLAN Dissertation Award Committee, (SIGPLAN), 2011
- ACM SIGPLAN International Workshop on Programming Language And Systems Technologies for Internet Clients, (PLASTIC), 2011
- SPLASH 2010 Workshop on Concurrency for the Application Programmer, (CAP), 2010
- ACM SIGPLAN 2010 Conference on Programming Language Design and Implementation (PLDI), (PLDI), 2010
- ACM SIGPLAN 2009 Conference on Programming Language Design and Implementation, External Committee Member , (PLDI), 2009

- PLDI FIT Session, (PLDI), 2009
- IEEE Micro Top Pics, (IEEE), 2008
- 17th International Conference on Parallel Architectures and Compilation Techniques, (PACT), 2008
- Steering Committee for the PL Curricula Workshop, (PL Curricula Workshop), 2008
- 13th International Conference on Architectural Support for Programming Languages and Operating Systems , (ASPLOS), 2008
- International Symposium on Code Generation and Optimization, (CGO), 2007
- 16th International Conference on Compiler Construction, (CC), 2007
- 6th International ACM SIGPLAN Conference on Generative Programming and Component Engineering, (GPCE), 2007
- ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation, (PEPM), 2007
- Technology eXchange (eTX) Workshop, (OOPSLA), 2005
- Symposium on Principles of Programming Languages, (POPL), 2005
- Code Generation and Optimization, (CGO), 2004
- International Conference on Compiler Construction, (CC), 2004
- Symposium on Principles of Programming Languages, (POPL), 2003
- International Conference on Supercomputing, (ICS), 2002
- International Conference on Compiler Construction, (CC), 2002
- Third ACM Workshop on Feedback-Directed and Dynamic Optimization, (FDDO-3), 2001
- International Conference on Parallel Architectures and Compilation Techniques, (PACT), 2001
- 5th Annual Workshop on Interaction between Compilers and Computer Architectures, (INTERACT-5), 2001

### **Member of Review Panel**

- NSF Proposal Review Panel, May 2014.
- NSF Proposal Review Panel, March 2010.
- NSF Proposal Review Panel, 2008.
- NSF Proposal Review Panel, December 2004.
- NSF Proposal Review Panel, March 2003.
- NSF Proposal Review Panel, 2001.