VITA
RAJIV GUPTA

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RESEARCH INTERESTS

High-Performance Computing: Programming, Compiler, Runtime, and Architectural Support;

Scalable Irregular Data Analytics on GPU & Custom Accelerator-based Heterogeneous Clusters;

Software Tools for Monitoring, Analysis, Debugging, and Slicing of Parallel Programs.

EDUCATION

Ph.D. in Computer Science, University of Pittsburgh, PA, Thesis title: "A Reconfigurable LIW Architecture and its Compiler," Aug. 1987 (Advisor: Prof. M.L. Soffa).

M.S. in Computer Science, University of Pittsburgh, PA, Project Title: "Storage Management Schemes for Retentive Control," April 1984 (Advisor: Prof. M.L. Soffa).

B.Tech. in Electrical Engineering, Indian Institute of Technology, New Delhi, India, April 1982.

APPOINTMENTS

Associate Dean for Academic Personnel, Bourns College of Engineering, 7/2022 – ∼

Amrik Singh Poonian Chair in Computer Science, UC Riverside, 7/2020 – ∼

Distinguished Professor, Department of Comp. Science & Engr., UC Riverside, 7/2017 – ∼

Vice Chair, Department of Computer Science & Engineering, UC Riverside, 7/2021 – 6/2022.

Professor, Department of Comp. Science & Engr., UC Riverside, 8/2007 - 6/2017.

Professor, Department of Computer Science, The University of Arizona, 8/1999 - 8/2007.

Professor, Department of Computer Science, University of Pittsburgh, 9/1998 - 8/1999.

Associate Professor, Dept. of Computer Science, University of Pittsburgh, 9/1994 - 8/1998.

Faculty Member, Computer Engineering Program, University of Pittsburgh, 9/1997 - 8/1999.

Visiting Faculty, Microprocessor Research Lab, Intel Corporation, 9/1996 - 12/1996.

Assistant Professor, Dept. of Computer Science, University of Pittsburgh, 9/1990 - 8/1994.

Senior Member Research Staff, Philips Laboratories, Briarcliff Manor, NY, 10/1987 - 8/1990.

Research/Teaching Assistant, Dept. of Comp. Science, Univ. of Pittsburgh, 9/1982 - 8/1987.

AWARDS AND HONORS

Technical Advisory Group

- Member, *Technical Advisory Group* on **Networking and Information Technology** for the **US President's Council of Advisors in Science and Technology**, May 2006 – Sept. 2007.

Research (h-index = 66 → `https://scholar.google.com/citations?user=6P4bGWAAAAAJ`)

- **ACM Fellow** (2009) - *for contributions to program analysis and optimization and sustained professional service to the computer science research community.*
- **IEEE Fellow** (2008) - *for contributions to computer architecture and optimizing compilers.*
- **AAAS Fellow** (2011) - *for contributions to computer architecture and optimizing compilers.*
- **AAIA Fellow** (6/2021) - *for outstanding achievements in high performance computing.*
- **UCR Doctoral Dissertation Advisor/Mentor Award**, 2012.
- **HiPC 2020 Best Paper Award**: "SimGQ: Simultaneously Evaluating Iterative Graph Queries," *IEEE International Conf. on High Performance Computing, Data, and Analytics*, Dec. 2020.
- **LCPC 2015 Best Student Paper Award**: "Size Oblivious Programming with *InfiniMem*," *International Workshop on Languages and Compilers for Parallel Computing*, Sept. 2015.
- **PACT 2010 Best Paper Award**: "Efficient Sequential Consistency Using Conditional Fences," *International Conference on Parallel Archiectures and Compilation*, September 2010.
- **ICPP 2003 Most Original Paper Award**: "Enabling Partial Cache Line Prefetching Through Data Compression," *International Conference on Parallel Processing*, October 2003.
- **ICSE 2003 Distinguished Paper Award**: "Precise Dynamic Slicing Algorithms," *International Conference on Software Engineering*, May 2003.
- **Most Influential Papers of PLDI 1979-1999**: "Complete Removal of Redundant Computations," *ACM SIGPLAN Conference on Programming Language Design and Implementation*, June 1998. Reprint and retrospective in *20 Years of PLDI (1979-1999): A Selection*, 2004.
- **ICECCS 1996 Outstanding Paper Award**: "Designing a Non-intrusive Monitoring Tool for Developing Complex Distributed Applications," *Second IEEE International Conference on Engineering of Complex Computer Systems*, Montreal, Canada, October 1996.
- *Dissertation Advisor* of **ACM SIGPLAN Outstanding Doctoral Dissertation Award** winners:
  - Rastislav Bodik, *Path and Value Sensitive Code Optimizations*, 2001.
  - Xiangyu Zhang, *Fault Location Via Precise Dynamic Slicing*, 2006.
- **Presidential Young Investigator Award**, National Science Foundation, 1991.
- **Faculty Impact Award**, CS Department, The University of Arizona, 2006 and 2007.
- **Making a Difference Award**, Philips Laboratories, Briarcliff Manor, New York, 1988.
- **Andrew Mellon Predoctoral Fellow**, FAS, University of Pittsburgh, Pittsburgh, PA, 1985.

Teaching: Obtained the highest student evaluation score among CS faculty teaching:

- a graduate core course during academic year 1995-1996, University of Pittsburgh.
- an advanced graduate elective during academic year 1995-1996, University of Pittsburgh.
- a graduate core course during academic year 1994-1995, University of Pittsburgh.

Service

- **ACM Recognition of Service Award** for serving as the General Chair for PPoPP 2020.
- **ACM Recognition of Service Award** for serving as the General Chair for ASPLOS 2011.
- **ACM Recognition of Service Award** for serving as the General Chair for PLDI 2008.
- **ACM Recognition of Service Award** for serving as the Program Chair for LCTES 2005.
- **ACM Recognition of Service Award** for serving as the General Chair for CGO 2005.
- **ACM Recognition of Service Award** for serving as the Program Chair for PLDI 2003.
- **Recognition of Contributions and Leadership** at HiPC 2004.
- **ACM Recognition of Service Award** for serving as the Workshops Chair for ICS 2002.
- **IEEE Distinguished Visitor**, IEEE Computer Society, 2024-2026, 2000-2002.

RESEARCH

JOURNAL PUBLICATIONS

1. C. Xu, A. Mazloumi, X. Jiang, and R. Gupta, "SimGQ+: Simultaneously Evaluating Iterative Point-to-All and Point-to-Point Graph Queries," *Journal of Parallel and Distributed Computing* (JPDC), Volume 164, pages 12-27, June 2022. *Among best papers from HiPC 2020 whose extended versions were* ***invited*** *for publication in JPDC special issue.*

2. X. Jiang, C. Xu, and R. Gupta, "VRGQ: Evaluating a Stream of Iterative Graph Queries via Value Reuse," *ACM SIGOPS Operating Systems Review,* ***invited*** *for publication in a special issue on Graph Computing*, Volume 55, Issue 1, pages 11-20, July 2021.

3. Z. Benavides, K. Vora, R. Gupta, and X. Zhang, "Annotation Guided Collection of Context-Sensitive Parallel Execution Profiles," *Formal Methods in System Design, An International Journal* (FMSD), Springer, Volume 54, Issue 3, pages 388-415, November 2019. *Among best papers from RV 2017 whose extended versions were* ***invited*** *for publication in FMSD.*

4. Z. Benavides, K. Vora, and R. Gupta, "DProf: Distributed Profiler with Strong Guarantees," *Proceedings of the ACM on Programming Languages* (PACMPL), Volume 3, Issue OOPSLA, Article 156, 24 pages, Athens, Greece, October 2019.

5. S-C. Koduru, K. Vora, and R. Gupta, "Software Speculation on Caching DSMs," *International Journal of Parallel Programming* (IJPP), Vol. 46, Issue 2, pages 313-332, April 2018.

6. K. Vora, R. Gupta, and G. Xu, "Synergistic Analysis of Evolving Graphs," *ACM Transactions on Architecture and Code Optimization* (TACO), Volume 13, Issue 4, Article No. 32, 27 pages, December 2016.

7. K.K. Pusukuri, R. Gupta, and L.N. Bhuyan, "Tumbler: An Effective Load Balancing Technique for MultiCPU Multicore Systems," *ACM Transactions on Architecture and Code Optimization* (TACO), Volume 12, Issue 4, Article No. 36, 24 pages, January 2016.

8. K.K. Pusukuri, R. Gupta, and L.N. Bhuyan, "ADAPT: A Framework for Co-Scheduling Multithreaded Programs," *ACM Transactions on Architecture and Code Optimization* (TACO), special issue of papers presented at HiPEAC 2013, Volume 9, Issue 4, Article No. 45, 25 pages, January 2013.

9. M.E. Belviranli, L.N. Bhuyan, and R. Gupta, "A Dynamic Self Scheduling Scheme for Heterogeneous Multiprocessor Architectures," *ACM Transactions on Architecture and Code Optimization* (TACO), special issue of papers presented at HiPEAC 2013, Volume 9, Issue 4, Article No. 57, 20 pages, January 2013.

10. V. Nagarajan, D. Jeffrey, and R. Gupta, "A System for Debugging via Online Tracing and Dynamic Slicing," *Software – Practice And Experience* (SP&E), Vol. 42, No. 8, pages 995-1014, August 2012.

11. M. Feng, C. Lin, and R. Gupta, "PLDS: Partitioning Linked Data Structures for Parallelism," *ACM Transactions on Architecture and Code Optimization* (TACO), special issue of papers presented at HiPEAC 2012, Volume 8, Issue 4, Article No. 38, 21 pages, January 2012.

12. K.K. Pusukuri, R. Gupta, and L.N. Bhuyan, "Thread Tranquilizer: Dynamically Reducing Performance Variation," *ACM Transactions on Architecture and Code Optimization* (TACO), special issue of papers presented at HiPEAC 2012, Volume 8, Issue 4, Article No. 46, 21 pages, January 2012.

13. C. Lin V. Nagarajan, and R. Gupta, "Efficient Sequential Consistency Using Conditional Fences," *International Journal of Parallel Programming* (IJPP), Vol. 40, No. 1, pages 84-117, special issue of **invited** Best Papers from PACT 2010, Feb. 2012.

14. M. Feng, C. Tian, C. Lin, and R. Gupta, "Dynamic Access Distance Driven Cache Replacement," *ACM Transactions on Architecture and Code Optimization* (TACO), Volume 8, Issue 3, Article No. 14, 30 pages, October 2011.

15. D. Jeffrey, Y. Wang, C. Tian, and R. Gupta, "Isolating Bugs in Multithreaded Programs Using Execution Suppression," *Software – Practice And Experience* (SP&E), Vol. 41, No. 11, pages 1259-1288, October 2011.

16. D. Jeffrey, V. Nagarajan, and R. Gupta, "Execution Suppression: An Automated Iterative Technique for Locating Memory Bugs," *ACM Transactions on Programming Languages and Systems* (TOPLAS), Volume 32, Issue 5, Article No. 17, 36 pages, May 2010.

17. C. Tian, M. Feng, V. Nagarajan, and R. Gupta, "Speculative Parallelization of Sequential Loops On Multicores," *International Journal of Parallel Programming* (IJPP), Vol. 37, No. 5, pages 508-535, October 2009.

18. C. Tian, V. Nagarajan, R. Gupta, and S. Tallam, "Automated Dynamic Detection of Busy-Wait Synchrnizations," *Software – Practice And Experience* (SP&E), Vol. 39, No. 11, pages 947-972, Aug. 2009.

19. V. Nagarajan, R. Gupta, and A. Krishnaswamy, "Compiler-Assisted Memory Encryption for Embedded Processors," *Transactions on High Performance Embedded Architectures and Compilers* (THiPEAC), special issue of **invited** Best Papers from HiPEAC 2007, LNCS 5470, Springer, Vol. 2, pages 23-44, 2009.

20. V. Nagarajan and R. Gupta, "Runtime Monitoring on Multicores via OASES," *ACM SIGOPS Operating Systems Review*, **invited** for special issue on the interaction among the OS, Compilers, and Multicore Processors, pages 15-24, Vol. 43, No. 2, April 2009.

21. S. Tallam and R. Gupta, "Unified Control Flow and Dependence Traces," *ACM Transactions on Architecture and Code Optimization* (ACM TACO), Vol. 4, No. 3, 31 pages, September 2007.

22. X. Zhang, N. Gupta, and R. Gupta, "Locating Faulty Code by Multiple Points Slicing," *Software - Practice & Experience* (SP&E), Vol. 37, Issue 9, pages 935-961, July 2007.

23. X. Zhang, N. Gupta, and R. Gupta, "A Study of Effectiveness of Dynamic Slicing in Locating Real Faults," *Empirical Software Engineering* Journal, Vol. 12, No. 2, pages 143-160, April 2007.

24. Y. Lin, Y. Zhang, and R. Gupta, "The Design and Evaluation of Path Matching Schemes on Compressed Control Flow Traces," *Journal of Systems and Software*, Vol. 80, No. 3, pages 396-409, 2007.

25. Y. Zhang and R. Gupta, "Compressing Heap Data for Improved Memory Performance," *Software - Practice & Experience* (SP&E), Volume 36, Issue 10, pages 1081-1111, August 2006.

26. X. Zhang and R. Gupta, "Whole Execution Traces and their Applications," *ACM Transactions on Architecture and Code Optimization* (ACM TACO), Vol. 2, No. 3, pages 301-334, September 2005.

27. X. Zhang, R. Gupta, and Y. Zhang, "Cost and Precision Tradeoffs of Dynamic Slicing Algorithms," *ACM Transactions on Programming Languages and Systems* (ACM TOPLAS), Vol. 27, No. 4, pages 631-661, July 2005.

28. A. Krishnaswamy and R. Gupta, "Dynamic Coalescing of 16-bit Instructions," *ACM Transactions on Embedded Computing Systems* (ACM TECS), special issue **invited** best papers from LCTES'03, Vol. 4, No. 1, pages 3-37, February 2005.

29. J. Yang, R. Gupta, and C. Zhang, "Frequent Value Encoding for Low Power Data Buses," *ACM Transactions on Design Automation of Electronic Systems* (ACM TODAES), Vol. 9, No. 3, pages 354-384, July 2004.

30. A. Krishnaswamy and R. Gupta, "Mixed Width Instruction Sets," *Communications of the ACM* (CACM), **invited** for a special section on Program Compaction, Vol. 46, No. 8, pages 47-52, August 2003.

31. X. Yuan, R. Melhem, and R. Gupta, "Algorithms for Supporting Compiled Communication," *IEEE Transactions on Parallel and Distributed Systems* (IEEE TPDS), Vol. 14, No. 2, pages 107-118, February 2003.

32. J. Yang and R. Gupta, "Frequent Value Locality and its Applications," *ACM Transactions on Embedded Computing Systems* (ACM TECS), special inaugural issue on memory systems, Vol. 1, No. 1, pages 79-105, November 2002.

33. S. Onder and R. Gupta, "Dynamic Memory Disambiguation in Presence of Out-of-order Store Issuing," *The Journal of Instruction Level Parallelism* (IJPP), http://www.jilp.org/vol4, Vol. 4, 2002.

34. X. Yuan, R. Melhem, and R. Gupta, "Performance of Multi-Hop Communications Using Logical Topologies on Optical Torus Networks," *Journal of Parallel and Distributed Computing* (JPDC), Vol. 61, No. 6, pages 748-766, June 2001.

35. R. Gupta, S. Pande, K. Psarris, and V. Sarkar, "Compiling for Parallel Systems," **invited** to *Parallel Computing* journal, North Holland, Vol. 25, No. 13-14, pages 1741-1783, December 1999.

36. X. Yuan, R. Melhem, and R. Gupta, "Distributed Path Reservation Algorithms for Multiplexed All-Optical Interconnection Networks," *IEEE Transactions on Computers* (IEEE TC), Vol. 48, No. 12, pages 1355-1363, December 1999.

37. X. Yuan, R. Melhem, R. Gupta, Y. Mei, and C. Qiao, "Distributed Control for Wavelength Reservation and their Performance Evaluation," *Photonic Network Communications* journal, Kluwer Academic Publishers, Vol. 1, No. 3, pages 207-218, November 1999.

38. C. Gong, R. Melhem, and R. Gupta, "On-Line Error Detection through Data Duplication in Distributed-Memory Systems," *Microprocessor and Microsystems*, a special issue on Fault Tolerance, Vol. 21, No. 3, pages 197-209, December 1997.

39. X. Yuan, R. Gupta, and R. Melhem, "Demand-Driven Data Flow Analysis for Communication Optimization," *Parallel Processing Letters*, Vol. 7, No. 4, pages 359-370, December 1997.

40. E. Duesterwald, R. Gupta, and M.L. Soffa, "A Practical Framework for Demand-Driven Interprocedural Data Flow Analysis," *ACM Transactions on Programming Languages and Systems* (ACM TOPLAS), Vol. 19, No. 6, pages 992-1030, November 1997.

41. R. Gupta, M.L. Soffa, and J.H. Howard, "Hybrid Slicing: Integrating Dynamic Information with Static Analysis," *ACM Transactions on Software Engineering and Methodology* (ACM TOSEM), among the best papers from FSE'95 whose extended versions were **invited** to TOSEM, Vol. 6, No. 4, pages 370-397, October 1997.

42. C. Gong, R. Melhem, and R. Gupta, "Loop Transformations for Fault Detection on Massively Parallel Systems," *IEEE Transactions on Parallel and Distributed Systems* (IEEE TPDS), Vol. 7, No. 12, pages 1239-1250, December 1996.

43. R. Bodik and R. Gupta, "Array Data-Flow Analysis for Load-Store Optimizations in Superscalar Architectures," *International Journal of Parallel Programming* (IJPP), special issue on Languages and Compilers for Parallel Computing, Vol. 24, No. 6, pages 481-512, 1996.

44. R. Gupta, M.J. Harrold, and M.L. Soffa, "Program Slicing-Based Regression Testing Techniques," *Journal of Software Testing, Verification and Reliability*, Vol. 6, No. 2, pages 83-112, June 1996.

45. R. Gupta and M. Spezialetti, "A Compact Task Graph Representation for Real-Time Scheduling," *Real Time Systems* journal, Vol. 11, No. 1, pages 71-102, 1996.

46. M. Spezialetti and R. Gupta, "Loop Monotonic Statements," *IEEE Transactions on Software Engineering* (IEEE TSE), Vol. 21, No. 6, pages 497-505, June 1995.

47. R. Gupta, "Generalized Dominators," *Information Processing Letters*, Vol. 53, pages 193-200, 1995.

48. R. Kramer, R. Gupta, and M.L. Soffa, "The Combining DAG: A Technique for Parallel Data Flow Analysis," *IEEE Transactions on Parallel and Distributed Systems* (IEEE TPDS), Vol. 5, No. 8, pages 805-813, August 1994.

49. R. Gupta, M.L. Soffa, and D. Ombres, "Efficient Register Allocation Via Coloring using Clique Separators," *ACM Transactions on Programming Languages and Systems* (ACM TOPLAS), Vol. 16, No. 3, pages 370-386, May 1994.

50. R. Gupta, "Optimizing Array Bound Checks using Flow Analysis," *ACM Letters on Programming Languages and Systems* (ACM LOPLAS), Vol. 2, Nos. 1-4, pages 135-150, March-December 1994.

51. R. Gupta and M.L. Soffa, "Employing Static information in the Generation of Test Cases," *Journal of Software Testing, Verification and Reliability*, Vol. 3, No. 1, pages 29-48, December 1993.

52. M.J. Harrold, R. Gupta, and M.L. Soffa, "A Methodology for Controlling the Size of a Test Suite," *ACM Transactions on Software Engineering and Methodology* (ACM TOSEM), Vol. 2, No. 3, pages 270-285, July 1993.

53. R. Gupta, "SPMD Execution of Programs with Pointer-based Data Structures on Distributed-Memory Machines," *Journal of Parallel and Distributed Computing* (JPDC), special issue on Multicomputer Programming and Application, Vol. 16, No. 2, pages 92-107, October 1992.

54. P. Gopinath, T. Bihari, and R. Gupta, "Compiler Techniques for Generating Predictable Object-Oriented Real-Time Software," *IEEE Software*, special issue on Real-time systems, pages 45-50, September 1992.

55. R. Gupta, "Synchronization and Communication Costs of Loop Partitioning on Shared-Memory Multiprocessor Systems," *IEEE Transactions on Parallel and Distributed Systems* (IEEE TPDS), Vol. 3, No. 4, pages 505-512, July 1992.

56. R. Gupta and S. Lee, "Exploiting Parallelism on a Fine-Grained MIMD Architecture Based Upon Channel Queues," *International Journal of Parallel Programming* (IJPP), Vol. 21, No. 5, pages 169-192, June 1992.

57. R. Gupta and M.L. Soffa, "Compile-time Techniques for Improving Scalar Access Performance in Parallel Memories," *IEEE Transactions on Parallel and Distributed Systems* (IEEE TPDS), Vol. 2, No. 2, pages 138-148, April 1991.

58. R. Gupta and M. Epstein, "Achieving Low Cost Synchronization in a Multiprocessor System," *Future Generation Computer Systems Journal*, special issue of **invited** best papers from PARLE'89 Conference, Vol. 6, No. 3, pages 255-269, December 1990.

59. R. Gupta and M. Epstein, "High Speed Synchronization of Processors Using Fuzzy Barriers," *International Journal of Parallel Programming* (IJPP), Vol. 19, No. 1, pages 53-73, 1990.

60. R. Gupta, "Debugging Code Reorganized by a Trace Scheduling Compiler," *Structured Programming*, Vol. 11, No. 3, pages 141-150, July 1990.

61. R. Gupta and M.L. Soffa, "Region Scheduling: An Approach for Detecting and Redistributing Parallelism," *IEEE Transactions on Software Engineering* (IEEE TSE), Vol. 16, No. 4, pages 421-431, April 1990.

62. R. Gupta and M.L. Soffa, "Compilation Techniques for a Reconfigurable LIW Architecture," *The Journal of Supercomputing*, Vol. 3, pages 271-304, 1989.

63. T.S. Anand and R. Gupta, "A Tool for Evaluating Compiler-based Parallelization Strategies," *Transactions of IMACS, Mathematics and Computing in Simulation*, **invited** to a special issue on Expert Systems for Numerical Computing, Vol. 31, No. 4, pages 509-516, October 1989.

64. R. Gupta and C.R. Hill, "A Scalable Implementation of Barrier Synchronization Using an Adaptive Combining Tree," *International Journal of Parallel Programming* (IJPP), Vol. 18, No. 3, pages 161-180, June 1989.

CONFERENCE PUBLICATIONS

65. X. Jiang, M. Afarin, Z. Zhao, N. Abu-Ghazaleh, and R. Gupta, "Core Graph: Exploiting Edge Centrality to Speedup the Evaluation of Iterative Graph Queries," *European Conference on Computer Systems* (EuroSys), pages 18-32, Athens, Greece, April 2024.

66. C. Gao, M. Afarin, S. Rahman, N. Abu-Ghazaleh, and R. Gupta, "MEGA Evolving Graph Accelerator," *56th IEEE/ACM International Symposium on Microarchitecture* (MICRO), pages 310-323, Toronto, Canada, 2023.

67. G. Kaur and R. Gupta, "OMRGx: Programmable and Transparent Out-of-Core Graph Partitioning and Processing," *ACM SIGPLAN International Symposium on Memory Management* (ISMM), pages 137-149, Orlando, Florida, June 2023.

68. X. Yin, Z. Zhao, and R. Gupta, "Glign: Taming Misaligned Graph Traversals in Concurrent Graph Processing," *28th ACM International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), Volume 1, pages 78-92, Vancouver, BC, March 2023.

69. M. Afarin, C. Gao, S. Rahman, N. Abu-Ghazaleh, and R. Gupta, "CommonGraph: Graph Analytics on Evolving Data," *28th ACM International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), Volume 2, pages 133-145, Vancouver, BC, March 2023.

70. S. Rahman, M. Afarin, N. Abu-Ghazaleh, and R. Gupta, "JetStream: Graph Analytics on Streaming Data with Event-Driven Hardware Accelerator," *54th IEEE/ACM International Symposium on Microarchitecture* (MICRO), pages 1091-1105, Athens, Greece, October 2021.

71. G. Kaur and R. Gupta, "GO: Out-Of-Core Partitioning of Large Irregular Graphs," *15th International Conference on Networking, Architecture, and Storage* (NAS), pages 9-18, Riverside, CA, October 2021.

72. B. Rowe and R. Gupta, "G-Morph: Induced Subgraph Isomorphism Search of Labeled Graphs on a GPU," *27th International European Conference on Parallel and Distributed Computing* (Euro-Par), *LNCS, volume 12820, Springer*, pages 402-417, Lisbon, Portugal, September 2021.

73. X. Sun and R. Gupta, "DSGEN: Concolic Testing GPU Implementations of Concurrent Dynamic Data Structures," *ACM International Conference on Supercomputing* (ICS), pages 75-87, June 2021.

74. X. Jiang, C. Xu, X. Yin, Z. Zhao, and R. Gupta, "Tripoline: Generalized Incremental Graph Processing via Graph Triangle Inequality," *European Conference on Computer Systems* (EuroSys), pages 17-32, UK, April 2021.

75. C. Xu, A. Mazloumi, X. Jiang, and R. Gupta, "SimGQ: Simultaneously Evaluating Iterative Graph Queries," *27th IEEE International Conference on High Performance Computing, Data, and Analytics* (HiPC), pages 1-10, Pune India, Dec. 2020. *Recipient of a* **Best Paper Award**.

76. A. Mazloumi, C. Xu, Z. Zhao, and R. Gupta, "BEAD: Batched Evaluation of Iterative Graph-Queries with Evolving Analytics Demands," *IEEE International Conference on Big Data* (IEEE BigData), pages 461-468, Atlanta, Georgia, December 2020.

77. S. Rahman, N. Abu-Ghazaleh, and R. Gupta, "GraphPulse: An Event-Driven Hardware Accelerator for Asynchronous Graph Processing," *53rd IEEE/ACM International Symposium on Microarchitecture* (MICRO), pages 908-921, Athens, Greece, October 2020.

78. A.H.N. Sabet, Z. Zhao, and R. Gupta, "Subway: Minimizing Data Transfer during Out-of-GPU-Memory Graph Processing," *European Conference on Computer Systems* (EuroSys), pages 1-16, Heraklion, Crete, Greece, April 2020.

79. A. Mazloumi, X. Jiang, and R. Gupta, "MultiLyra: Scalable Distributed Evaluation of Batches of Iterative Graph Queries," *IEEE International Conference on Big Data* (IEEE BigData), pages 349-358, Los Angeles, CA, December 2019.

80. A. Alavi, R. Gupta, and Z. Qian, "When The Attacker Knows a Lot: The GAGA Graph Anonymizer," *The 22nd Information Security Conference* (ISC), LNCS 11723, Springer, pages 211-230, New York, NY, September 2019.

81. T. Azim, A. Alavi, I. Neamtiu, and R. Gupta, "Dynamic Slicing for Android," *International Conference on Software Engineering* (ICSE), pages 1154-1164, Montreal, QC, Canada, May 2019. *Download*: `https://github.com/archer29m/AndroidSlicer`

82. I. Gasparis, Z. Qian, C. Song, S.V. Krishnamurthy, R. Gupta, and P. Yu, "Figment: Fine-grained Permission management for Mobile Apps," *IEEE International Conference on Computer Communications* (INFOCOM), pages 1405-1413, Paris, France, April-May, 2019.

83. C. Xu, K. Vora, and R. Gupta, "PnP: Pruning and Prediction for Point-To-Point Iterative Graph Analytics," *ACM International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS), pages 587-600, Providence, RI, April 2019.

84. W-C. Lee, Y. Liu, P. Liu, S. Ma, H.J. Choi, X. Zhang, and R. Gupta, "White-Box Program Tuning," *IEEE/ACM International Symposium on Code Generation and Optimization* (CGO), pages 122-135, Washington DC, Feb. 2019.

85. H. Li, Z. Chen, and R. Gupta, "Efficient Concolic Testing for MPI Applications," *International Conference on Compiler Construction* (CC), pages 193-204, Washington DC, Feb. 2019.

86. G. Kaur, K. Vora, S.C. Koduru, and R. Gupta, "OMR: Out-of-Core MapReduce for Large Data Sets," *ACM SIGPLAN International Symposium on Memory Management* (ISMM), pages 71-83, Philadelphia, Pennsylvania, June 2018. *Download*: `https://github.com/kevalvora/omr`

87. I. Gasparis, A. Aqil, Z. Qian, C. Song, S.V. Krishnamurthy, R. Gupta, and E. Colbert, "Droid M+: Developer Support for Imbibing Android's New Permission Model," *ACM Asia Conference on Computer and Communications Security* (ASIACCS), pages 765-776, Songdo, Incheon, Korea, June 2018.

88. H. Li, S. Li, Z. Benavides, Z. Chen, and R. Gupta, "COMPI: Concolic Testing for MPI Applications," *32nd IEEE International Parallel & Distributed Processing Symposium* (IPDPS), pages 865-874, Vancouver, British Columbia, Canada, May 2018.

89. H. Li, Z. Chen, and R. Gupta, "ParaStack: Efficient Hang Detection for MPI Programs at Large Scale," *ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis* (SC), Article No. 63, 12 pages, Denver, Colorado, November 2017.

90. Z. Benavides, R. Gupta, and X. Zhang, "Annotation Guided Collection of Context-Sensitive Parallel Execution Profiles," *The 17th International Conference on Runtime Verification* (RV), LNCS, volume 10548, Springer, pages 103-120, Seattle, Washington, September 2017.

91. K. Vora, R. Gupta, and G. Xu, "KickStarter: Fast and Accurate Computations on Streaming Graphs via Trimmed Approximations," *ACM International Conference on Architectural Sup-*

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INVITED PRESENTATIONS

1. *Second International Conference on Informatics* (ICI 2023), **Keynote Speaker**, "Efficient Big Graph Analytics Via Redundancy Reduction," November 2023.
2. *University of California*, Riverside, "Parallel Graph Processing on Clusters, Multicores, and GPUs," May 2020.
3. *Virginia Tech*, Blacksburg, **Distinguished Lecture Series Speaker**, "Parallel Graph Processing on Clusters, Multicores, and GPUs," November 2018.
4. *University of Southern California*, Los Angeles, "Parallel Graph Processing on GPUs, Clusters, and Multicores," September 2016.
5. *University of California*, Irvine, **EECS Distinguished Seminar Series Speaker**, "Parallel Graph Processing on GPUs and Clusters," March 2016.
6. *University of California*, Irvine, "Exploiting Parallelism on Multicores Via SpiceC," April 2013.

7. *4th Compiler Assisted SoC Assembly Workshop* (CASA'08 - held at ESWEEK), "Speculative Parallelization of Applications on Multicores," October 2008.
8. *Google*, Mountain View, "Speculative Parallelization of Applications on Multicores," October 2008.
9. *Workshop on Dynamic Analysis* (WODA'07 - held at ICSE), **Keynote Speaker**, "Scalable Dynamic Analysis for Automated Fault Location and Avoidance," May 2007.
10. *University of California*, Davis, "Delievering Processor Performance with Limited Energy and Memory Resources," April 2007.
11. *Microsoft Research*, Redmond, " Scalable Dynamic Analysis for Automated Fault Location," March 2007.
12. *University of Colorado*, Boulder, "Reliable and Optimized Embedded Systems," March 2007.
13. *The College of William and Mary*, Williamsburg, VA, "Safety and Optimization of Embedded Systems," Jan. 2007.
14. *University of California*, Riverside, "Safety and Optimization of Embedded Systems," December 2006.
15. *Massachusetts Institute of Technology*, "Safety and Optimization of Embedded Systems," Joint EECS and Aeronautics & Astronautics Seminar, May 2006.
16. Taught a course on "Compiling for Embedded Processors," First HiPEAC Summer School on *Advanced Computer Architectures and Compilation for Embedded Systems* (ACACES), L'Aquila, Italy, July 2005.
17. *Microsoft Research Faculty Summit*, "Using Phoenix for Exploring Whole Execution Traces," Redmond, Washington, July 2005.
18. *University of California*, San Diego, "Dynamic Execution Histories and their Applications," May 2005.
19. *Arizona State University*, Tempe, Arizona, "Whole Execution Trace and its Applications," December 2004.
20. *The College of William and Mary*, Williamsburg, VA, **Distinguished Lecture Series Speaker**, "Enabling the Design of Compilers and Architectures for Emerging Applications," October 2004.
21. *Microsoft Research Faculty Summit*, "Using Phoenix for Profiling Research," Redmond, August 2004.
22. *Infrastructure 2004: NSF CISE/EIA RI and MII PI's Workshop*, *Panelist:* "Research Challenges in Programming Languages: From Agendas To Impact," Snowbird, Utah, July 2004.
23. *University of Maryland*, College Park, "Enabling the Design of Compilers and Architectures for Emerging Applications," June 2004.
24. *University of California*, Irvine, Center for Embedded Computer Systems, "Frequent Value Locality and its Applications," May 2004.
25. *Arizona State University*, Tempe, Arizona, **CEINT Distinguished Seminar Series Speaker**, "Frequent Value Locality and its Applications," April 2004.
26. *Florida State University*, Tallahassee, FL, "Precise Dynamic Program Slicing Algorithms," April 2004.
27. *Intel Corporation*, Microcomputer Research Lab, Santa Clara, California, "Compiler and Architectural Support for Embedded Processors," March 2003.
28. *Penn State University*, State College, Pennsylvania, "Supporting Bit Section Addressing for Embedded Applications," December 2002.

29. *Purdue University*, West Lafayette, Indiana, "Supporting Bit Section Addressing for Embedded Applications," December 2002.

30. *Georgia Tech*, Atlanta, Georgia, "Architectural and Compiler Support for Performance Optimization Under Limited Power and Memory Resources," November 2002.

31. *Univ. of Texas at Austin*, Texas, "Frequent Value Locality and its Applications," Feb. 2002.

32. *Intel Corporation*, Microcomputer Research Lab, Santa Clara, California, "Frequent Values and their Applications," August 2001.

33. *Intel Corporation*, Microcomputer Research Lab, Santa Clara, California, "Optimizing Static Power Dissipation by Functional Units," August 2001.

34. *University of Alberta*, Edmonton, Canada, **Distinguished Lecture Series Speaker**, "Frequent Value Locality and its Applications," June 2001.

35. *University of Nevada at Reno*, Reno, Nevada, **IEEE Distinguished Speaker**, "Frequent Value Locality and its Applications," April 2001.

36. *Compaq*, Marlborough, MA, "Frequent Value Locality and its Applications," November 2000.

37. *Lucent Technologies*, Allentown, PA, "Path Sensitive Code Optimizations," June 1999.

38. *Georgia Tech*, Atlanta, Georgia, "Path Sensitive Code Optimizations," May 1999.

39. *Univ. of Maryland*, College Park, Maryland, "Path Sensitive Code Optimizations," April 1999.

40. *The Univ. of Arizona*, Tucson, Arizona, "Path Sensitive Code Optimizations," March 1999.

41. *Univ. of California, Los Angeles*, California, "Path Sensitive Code Optimizations," Jan. 1999.

42. *Florida State University*, Tallahassee, FL, "Path Sensitive Code Optimizations," Jan. 1999.

43. *IBM T.J. Watson Research Center*, Hawthorne, NY, "Profile Guided Redundancy and Dead Code Elimination," October 1998.

44. *Hewlett-Packard Labs*, Palo Alto, CA, "Path Profile Guided PRE and PDE," July 1997.

45. *Intel Seminar*, Santa Clara, CA, "A Demand-driven Framework for Interprocedural Data Flow Analysis," December 1996.

46. *Intel University Research Forum*, Santa Clara, CA, "Analysis and Optimization in an ILP Environment," November 1996.

47. *Hewlett-Packard Laboratories*, Palo Alto, CA, "Array Data Flow Analysis for Load-Store Optimizations in Superscalar Architectures," July 1995.

48. *Intel Corporation*, Santa Clara, CA, "Array Data Flow Analysis for Load-Store Optimizations in Superscalar Architectures," July 1995.

49. *Tartan, Inc.*, Pittsburgh, PA, "Demand-Driven Computation of Interprocedural Data Flow," June 1995.

50. *Tartan, Inc.*, Pittsburgh, PA, "Array Data Flow Analysis for Load-Store Optimizations in Superscalar Architectures," April 1995.

51. *Panelist:* "Program Transformations and Analysis for Real-Time Systems," *ACM SIGPLAN Workshop on Language, Compiler, and Tool Support for Real-Time Systems*, Orlando, FL, June 1994.

52. *Clemson University*, Clemson, South Carolina, "SPMD Execution of Programs on Distributed-Memory Machines," October 1993.

53. *Carnegie Mellon University*, Pittsburgh, PA, "A Practical Data Flow Framework for Array Reference Analysis and its Use in Optimizations," May 1993.

54. *University of Delaware*, Newark, Delaware, "SPMD Execution of Programs on Distributed-Memory Machines," December 1992.

55. *West Virginia University*, Morgantown, WV, "SPMD Execution of Programs on Distributed-Memory Machines," December 1992.

56. *NASA Ames Research Center*, Moffett Field, CA, "SPMD Execution of Programs on Distributed-Memory Machines," April 1992.

57. *IBM T.J. Watson Research Center*, Hawthorne, New York, "Fine-Grained Parallel Processing," April 1990.

58. *University of Illinois at Urbana-Champaign, C.S.R.D. – The Second Workshop on Programming Languages and Compilers for Parallel Computing*, "Compiler Techniques for Reducing Barrier Synchronization Overhead in Parallelized Loops," August 1989.

59. *Institute of Defense Analyses, Supercomputing Research Center, Leesburg, Virginia, – Parallelism Packaging Workshop*, "Using the Program Dependence Graph to Schedule Fine-grained Parallelism," April 1988.

RESEARCH GRANTS

Cisco Research Award, *Automated Search-Based Program Reduction and Testing for Efficient Vulnerability Detection*, $100,000, 04/2024 – 03/2025 (PI: R. Gupta; Co-PI: Q. Zhang).

Google Research Award, *Using Post Link Optimizations to Reduce Backend Stalls in Warehouse-Scale Applications*, $90,000, 12/2022 – 11/2023 (PI: R. Gupta).

National Science Foundation, Software and Hardware Foundations, *SHF: Small: CT-DDS – Scalable Concolic Testing of Parallel Applications With Shared Dynamic Data Structures*, CCF-2226448, $600,000, 10/2022 – 9/2025 (PI: R. Gupta).

National Science Foundation, Software and Hardware Foundations, *SHF: Small: MIGS – Efficiently Evaluating Multiple Iterative Graph Queries*, CCF-2002554, $500,000, 10/2020 – 9/2024 (PI: R. Gupta).

National Science Foundation, SPX: Scalable Parallelism in the Extreme: Principles and Practice of Scalable Systems, *PPoSS: Planning: Dynamic Big Graph Store for High-Throughput and Secure Distributed Query Processing*, CCF-2028714, $249,999, 10/2020 – 9/2021 (PI: R. Gupta; Co-PIs: N. Abu-Ghazaleh, Z. Zhao, C. Song, M. Sridharan).

National Science Foundation, Software and Hardware Foundations, *SHF: Small: GPU-dedicated Graph Transformations for Accelerating Iterative Graph Analytics*, CCF-1813173, $499,987, 10/2018 – 9/2022 (PI: Z. Zhao; Co-PI: R. Gupta).

National Science Foundation, Secure & Trustworthy Cyberspace, *TWC: Small: Collaborative: Improving Android Security with Dynamic Slicing*, CNS-1617424, UCR Portion $250,000, 9/2016 – 8/2020 (PIs: I. Neamtiu - NJIT; R. Gupta - UCR).

National Science Foundation, Software and Hardware Foundations, *SHF: Small: Transformations for Synergistic Analysis of Large Evolving Graphs*, CCF-1524852, $400,000, 7/2015 – 6/2020 (PI: R. Gupta).

National Science Foundation, Software and Hardware Foundations, *SHF: Small: Memory Consistency – Hardware, Compiler, and Programming Support*, $539,999, CCF-1318103: $450,000 (9/2013) + CCF-1547990: $89,999 supplement (8/2015), 9/2013 – 8/2017 (PI: R. Gupta).

Intel Corporation, *Dynamic Slicing on Android-x86*, $65,000, 7/2014 – 9/2015 (PI: I. Neamtiu; Co-PI: R. Gupta).

Intel Corporation, *Dynamic Slicing for Interactive Debugging of Multithreaded Programs*, $65,000, 7/2013 – 9/2014 (PI: R. Gupta; Co-PI: I. Neamtiu).

Google Research Award, *Size Oblivious Programming for Large Dynamic Data Structures*, $48,500, 03/2013 – 02/2014 (PI: R. Gupta).

National Science Foundation, Computing Systems Research, *EAGER: Developing a Programming Environment for Heterogeneous Multiprocessors*, CNS-1157377, $299,288, 9/2012 – 8/2014 (PI: L.N. Bhuyan; Co-PI: R. Gupta).

Intel Corporation, *Supporting Dynamic Slicing for Interactive Debugging*, $65,000, 6/2012 – 5/2013 (PI: R. Gupta).

National Science Foundation, Software and Hardware Foundations, *WORKSHOP: Support for the Sixteenth International Conference on Architectural Support for Programming Languages and Operating Systems* (ASPLOS 2011), CCF-1059827, $15,000, 12/2010 – 6/2011 (PI: P. Brisk; Co-PI: R. Gupta).

National Science Foundation, Software and Hardware Foundations, *SHF: Medium: Programmable Monitoring Framework for Multicore Systems*, CCF-0963996, $726,000, 9/2010 – 8/2014 (PI: R. Gupta; Co-PI: I. Neamtiu).

National Science Foundation, Software and Hardware Foundations, *SHF: Medium: Hardware/Software Partitioning for Hybrid Shared Memory Multiprocessors*, CCF-0905509, $800,000, 9/2009 – 8/2015 (PI: L. Bhuyan; Co-PIs: R. Gupta, W. Najjar).

National Science Foundation, Computing Systems Research, *Scalable and Efficient Dynamic Information Flow Tracking in Multithreaded Programs*, CNS-0751961/0719791, UCR funds $180,000, 9/2007 – 8/2010 (PI: R. Gupta; Co-PI: X. Zhang).

National Science Foundation, Computing Research Infrastructure, *An Advanced Infrastructure for Generation, Storage, and Analysis of Program Execution Traces*, CNS-0751949/0708199, UCR funds $85,000, 9/2007 – 9/2010 (PI: R. Gupta; Co-PIs: N. Gupta, X. Zhang).

National Science Foundation, Computing Systems Research, *ExPert: dynamic analysis based fault location via Execution Perturbations*, CNS-0810906/0614707, $332,000, 9/2006 – 8/2010 (PIs: R. Gupta, N. Gupta).

Microsoft Research, Redmond, Washington, *Integrating Dynamic Slicing into the coredbg Debugger*, $48,000, 4/2006 – 3/2007 (PI: N. Gupta; Co-PI: R. Gupta).

National Science Foundation, Computing Processes and Artifacts, *Dynamic Unmasking of Compiler Optimizations and Obfuscations*, CCF-0753470/0541382, $300,000, 2/2006 – 1/2010 (PI: R. Gupta).

IBM, Eclipse Innovation Award, *An Eclipse Module for Matching Execution Histories of Program Versions*, $27,000, 1/2005 – 12/2005 (PI: R. Gupta; Co-PI: N. Gupta).

National Science Foundation, ITR Medium Grants, *Morphable Software Services: Self-Modifying Programs for Distributed Embedded Systems*, CCF-0324969, U. of Arizona funds $166,225, 10/2003 – 9/2007 (PI: K. Schwan; Co-PIs: T. Balch, G. Eisenhauer, R. Gupta, S. Pande, C. Pu, H-H. S. Lee).

Microsoft Research, Redmond, Washington, *Using Phoenix for Program Slicing and its Application to Defect Analysis*, $121,000, 9/2003 – 8/2006. Matching funds from ACIST at Univ. of Arizona $42,500 (PI: R. Gupta).

Intel Corporation, MRL, Santa Clara, California, *Compiling for Processors with Fine-Grained Threading, Heterogenous Cores, and Sophisticated Data Management*, $108,500, 9/2003 – 8/2006 (PI: R. Gupta).

IBM, Eclipse Innovation Award, *Protecting Software through Slicing and Obfuscation Transformations*, $27,000, 1/2003 – 12/2003 (PI: R. Gupta). Seed grant of $14,000 provided by ACIST, Univ. of Arizona.

National Science Foundation, Computer Systems Architecture, *Information Encoding for Energy Efficient Processor Design*, CCF-0208756, $280,000, 9/2002 – 8/2006 (PI: R. Gupta).

National Science Foundation, ITR Small Grants, *Code and Data Segment Optimizations for Mixed Width Instruction Set Embedded Processor*, CCF-0220334, U. of Arizona funds $149,112, 9/2002 – 8/2005 (PI: R. Gupta; Co-PI: S. Pande). Seed grant of $10,000 provided by ACIST, Univ. of Arizona.

National Science Foundation, Compilers, *Data Compression Techniques for Improving Memory Hierarchy Performance*, CCF-0105355, $270,000, 9/2001 – 8/2005(PI: R. Gupta).

DARPA, Power Aware Computing/Communication, *Power-Adaptive Microarchitecture and Compiler Design for Mobile Computing*, Award no. F29601-00-1-0183, $572,396, 7/2000 – 11/2002 (PI: R. Gupta; Co-PIs: S. Onder and S. Pande).

National Science Foundation, CISE Research Infrastructure, *Optimization of Distributed and Networked Systems: A Spectrum of Techniques*, EIA-0080123, $1,396,252, 9/2000 – 9/2005 (PIs: G.R. Andrews, S. Debray, R. Gupta, S. Pink, and R.T. Snodgrass).

Intel Corporation, MRL, Santa Clara, California, *Exploiting Speculation and Predication for Branch and Load Optimizations*, $96,000, 9/1999 – 6/2002 (PI: R. Gupta).

National Science Foundation, Experimental Systems, *Experimental Evaluation of Scalable Optimization Techniques*, EIA-9806525, $400,000, 9/1998 – 9/2001 (PI: M.L. Soffa; Co-PIs: R. Gupta, L.L. Pollock, and D. Whalley).

National Science Foundation, Compilers, *A Framework for Path and Resource Sensitive Optimizations*, CCR-0096122/CCR-9808590, $360,000, 9/1998 – 9/2002 (PI: R. Gupta; Co-PI: M.L. Soffa).

Intel Corporation, MRL, Santa Clara, California, *Machine Dependent Analysis for Exploiting ILP in VLIW Architectures*, $32,000, 1/1998 – 12/1998 (PI; R. Gupta).

Hewlett Packard Laboratories, Chelmsford, Massachusetts, *Comparative Debugging of Optimized Code*, $236,131, 5/1997 – 4/1998 (PI: M.L. Soffa; Co-PI: R. Gupta).

Hewlett Packard Laboratories, Palo Alto, California, *Optimizations Techniques for Superscalar and VLIW Architectures*, $34,484, 5/1997 – 4/1998 (PI: R. Gupta; Co-PI: M.L. Soffa).

National Science Foundation, Operating Systems, *On-line Avoidance of Monitoring Intrusion in Distributed Systems*, CCR-9996362/CCR-9704350, $156,012, 6/1997 – 8/2000 (PI: R. Gupta).

Intel Corporation, Santa Clara, California, *Machine Dependent Analysis for Exploiting ILP in VLIW Architectures*, $72,038, 1/1997 – 12/1997 (PI: R. Gupta).

National Science Foundation, Compilers, *Research Experience with Undergraduates*, supplement to *Loop Transformations and Scheduling Strategies for Parallelizing Software*, CCR-9157371, $4,950, 8/1996 – 7/1997 (PI: R. Gupta).

Hewlett Packard Laboratories, Palo Alto, California, *Optimizations Techniques for Superscalar/ VLIW Architectures*, $68,550, 1/1996 – 4/1997 (PI: R. Gupta; Co-PI: M.L. Soffa).

Hewlett Packard Laboratories, Chelmsford, Massachusetts, *Debugging of Optimized Code*, $102,290, 1/1996 – 4/1997 (PI: M.L. Soffa; Co-PI: R. Gupta).

Intel Corporation, Santa Clara, California, *Static Analysis and Optimization Techniques for Exploiting ILP in Superscalar/VLIW Architectures*, $20,000, 1/1996 – 12/1996 (Pi: R. Gupta).

National Science Foundation, Software Engineering, *Demand Driven Computation of Partial Data Flow and its Application in Software Engineering*, CCR-9402226, $240,000, 9/1995 – 8/1998 (PI: M.L. Soffa; Co-PI: R. Gupta).

Hewlett Packard Laboratories, Palo Alto, California, *Data Flow Analysis and Optimization Techniques for Superscalar/VLIW Architectures*, $57,022, 3/1995 – 4/1996 (PI: R. Gupta).

Intel Corporation, Santa Clara, California, *Optimizations to Facilitate ILP for Superscalar/VLIW Architectures*, $21,116, 1/1995 – 12/1995 (PI: R. Gupta).

Digital Equipment Corporation, Pittsburgh, Pennsylvania, *Equipment Support for Studying the Interaction between Transformations and Scheduling Strategies in Compilers*, $14,661, 2/1993 (PI: R. Gupta).

Siemens Corporate Research, Inc., Princeton, New Jersey, *Research Assistantships*, $25,000, 6/1992 (Pi: R. Gupta).

Honeywell Inc., Minneapolis, Minnesota, *PORTAL Compiler and Fine-Grained Adaptation of Real-Time Schedules*, $5,000, 4/1992 – 8/1992 (PI: R. Gupta).

Philips Laboratories, Briarcliff Manor, New York, *POOMA Multiprocessor Prototype*, $35,000, 8/1992 (PI: R. Gupta).

National Science Foundation, Compilers, *Loop Transformations and Scheduling Strategies for Parallelizing Software*, Presidential Young Investigator Award CCR-9157371, $271,109, 8/1991 – 12/1997 (PI: R. Gupta).

Student Advising and Teaching

PhDs In Progress

- (2020) Mahbod Afarin; (2021) Rui Yang; (2022) Chaitanya Mamatha Ananda; (2023) Rebin Silva Valan Arasu; (2024) Farhana Akter Tumpa; Zohreh Abbasi Liasi (co-advisor: Qian Zhang).

PhDs Completed

1. Bryan Rowe, *Subgraph Isomorphism Search with Multi-Query Optimization on GPUs*, expected completion August 2024.
2. Xizhe Yin, *On the Scalability and Efficiency of Graph Processing Systems*, expected completion May 2024. (Co-advisor: Zhijia Zhao).
3. Abbas Mazloumi, *Distributed Evaluation of Batches of Iterative Graph Queries*, completed September 2023. *Lecturer, UC Riverside, CA* (Current).
4. Xiaolin Jiang, *Reuse Techniques for Efficiently Evaluating a Sequence of Iterative Graph Queries*, completed July 2023. *Software Engineer, Google, Mountain View, CA* (Current).
5. Xiaofan Sun, *Concolic Testing of Programs With Concurrent Dynamic Data Structures*, completed March 2023. *Software Engineer, NVIDIA, Santa Clara, CA* (Current).
6. Gurneet Kaur, *Out-Of-Core MapReduce System for Large Datasets*, completed December 2021. *Software Development Engineer, ESRI, Redlands, CA* (Current).
7. Chengshuo Xu, *Runtime Optimizations for Evaluating Batches of Graph Queries*, completed November 2021. *Member Technical Staff, Cerebras Systems, Sunnyvale, CA* (Current).
8. Shafiur Rahman, *Hardware Acceleration of Irregular Applications using Event-Driven Execution*, completed October 2021 (Co-advisor: Nael Abu-Ghazaleh). *Research Scientist, Tesla, Palo Alto, CA* (Current).

9. Arash Alavi, *Application of Software Analysis in Detecting Vulnerabilities: Testing and Security Assessment*, completed September 2019 (Co-advisor: Zhiyun Qian). *Software Researcher & Developer, Stanford Medicine, Stanford University, Palo Alto, CA* (Current).

10. Zachary Benavides, *Declarative Profiling for Parallel Systems*, completed September 2018. *Senior Engineer, Ambar, London* (Current).

11. Hongbo Li, *Pre- and Post-Deployment Dynamic Bug Detection Techniques for MPI Programs*, completed September 2018 (Co-advisor: Zizhong Chen). *Software Engineer, Latitude AI, Palo Alto, CA* (Current).

12. Keval Vora, *Exploiting Asynchrony for Performance and Fault Tolerance in Distributed Graph Processing*, completed June 2017. *Associate Professor, Simon Fraser University* (Current).

13. Farzad Khorasani, *High Performance Vertex-Centric Graph Analytics on GPUs*, completed September 2016. *Member Technical Staff, OpenAI, Palo Alto, CA* (Current).

14. Vineet Singh, *User Assisted Data Structure Debugging and Verification*, completed September 2016 (Co-advisor: Iulian Neamtiu). *Performance Architect, NVIDIA, Beaverton, OR.* (Current).

15. Amlan Kusum, *Adapting Data Representations for Optimizing Data-Intensive Applications*, completed September 2016 (Co-advisor: Iulian Neamtiu). *Senior Software Engineer, Microsoft, Redmond* (Current).

16. Bo Zhou, *Extracting Actionable Information From Bug Reports*, completed August 2016 (Co-advisor: Iulian Neamtiu). *Java Engineer, Flex, Chino Hills, CA* (Current).

17. Sai Charan Koduru, *Size Oblivious Programming of Clusters for Irregular Parallelism*, completed September 2015. *Senior Software Engineer, Google, Kirkland, WA* (Current).

18. Yan Wang, *Dynamic Analysis Techniques for Effective and Efficient Debugging*, completed August 2014 (Co-advisor: Iulian Neamtiu). *Software Engineer, Google, Mountain View, CA* (Current).

19. Changhui Lin, *Imposing Minimal Memory Ordering on Multiprocessors*, completed August 2013. *Software Engineer, Google, Mountain View, CA* (Current).

20. Min Feng, *The SpiceC Parallel Programming System*, completed August 2012. *Senior Staff Software Engineer, Inceptio Technology, Silicon Valley R&D Center* (Current).

21. Kishore Kumar Pusukuri, *Runtime Support for Exploiting Multicore Systems*, completed August 2012. *Principal Software Engineer, Apple, Cupertino, CA* (Current).

22. Chen Tian, *Speculative Parallelization on Multicore Processors*, completed May 2010. *VP of Technology & Engineering, Inceptio Technology, Silicon Valley R&D Center* (Current).

23. Vijayanand Nagarajan, *IMPRESS: Improving Multicore Performance and Reliability via Efficient Support for Software Monitoring*, completed August 2009. *Professor, The University of Utah, Salt Lake City* (Current).

24. Dennis Jeffrey, *Dynamic State Alteration Techniques for Automatically Locating Software Errors*, completed August 2009. *Senior Software Engineer in Test, Google, Mountain View, CA* (Current).

25. Sriraman Tallam, *Fault Location and Avoidance in Long-Running Multithreaded Applications*, completed October 2007. *Senior Staff Software Engineer, Google, Mountain View, CA* (Current).

26. Xiangyu Zhang, *Fault Location Via Precise Dynamic Slicing*, completed September 2006. **Recipient of SIGPLAN Outstanding Doctoral Dissertation Award**, 2006. **NSF CAREER Award**, 2009. *Full Professor, Purdue University* (Current).

27. Bengu Li, *Efficient Handling of Narrow Width and Streaming Data in Embedded Applications*, completed May 2006. *Software Engineer, Google, Kirkland, Washington* (Current).

28. Arvind Krishnaswamy, *Microarchitectural and Compiler Techniques for Dual-Width ISA Processors*, completed May 2006. *Senior Staff Engineer, Qualcomm, San Jose, CA* (Current).

29. Jun Yang, *Frequent Value Locality and its Application to Energy Efficient Memory Design*, completed September 2002. **NSF CAREER Award**, 2008. *William Kepler Whiteford Professor of ECE, University of Pittsburgh, PA* (Current).

30. Youtao Zhang, *The Design and Implementation of Compression Techniques for Profile Guided Compilation*, completed August 2002. **NSF CAREER Award**, 2005. *Full Professor, University of Pittsburgh, PA* (Current).

31. Clara Jaramillo, *Source Level Debugging Techniques and Tools for Optimized Code*, completed August 2000 (Co-advisor: Mary Lou Soffa). *Chatam College, Pittsburgh, PA* (First Employment).

32. Ras Bodik, *Path and Value Sensitive Code Optimizations*, completed November 1999 (Co-advisor: Mary Lou Soffa). **Recipient of SIGPLAN Outstanding Doctoral Dissertation Award**, 2001. **NSF CAREER Award**, 2001. **ACM Fellow**, 2018. *Professor, Univ. of Washington, Seattle* (Current).

33. Soner Onder, *Scalable Superscalar Processor Design*, completed July 1999. **NSF CAREER Award**, 2004. *Full Professor, Michigan Tech. University* (Current).

34. Xin Yuan, *Dynamic and Compiled Communication in Optical Time-Division-Multiplexed Point-to-Point Networks*, completed August 1998 (Co-advisor: Rami Melhem). *Professor and* **Department Chair**, *Florida State University* (Current).

35. Jodi Tims, *Integrating Automatic Data Distribution and Communication Optimization*, completed July 1998 (Co-advisor: Mary Lou Soffa). **ACM Distinguished Member**, 2019. *Professor and* **Department Chair**, *Baldwin Wallace College, Ohio. Professor of Practice*, *Northeastern Univ.* (Current).

36. Wanqing Wu, *On-line Avoidance of the Intrusive Effects of Monitoring of Distributed Applications*, completed July 1998. *SAP Labs, Palo Alto, CA* (Current).

37. Tia Watts, *MIST: An Approach to Integrating Restructuring Transformations and Multiple Scheduling Techniques*, completed December 1997 (Co-advisor: Mary Lou Soffa). *Full Professor, Sonoma State University, CA* (Current).

38. David Berson, *Unification of Register Allocation and Instruction Scheduling in Compilers for Fine-Grain Parallel Architectures*, completed November 1996 (Co-advisor: Mary Lou Soffa). *Senior Compiler Engineer, NVIDIA, Portland* (Current).

39. Evelyn Duesterwald, *A Demand Driven Approach for Efficient Interprocedural Data Flow Analysis*, completed July 1996 (Co-advisor: Mary Lou Soffa). **ACM Distinguished Scientist**, 2010. *Senior Manager, IBM Research, New York* (Current).

40. Chun Gong, *Fault Tolerant Computing on Distributed-Memory Systems: A Compiler Assisted Approach*, completed September 1995 (Co-advisor: Rami Melhem). *Microsoft Corporation, WA* (First Employment).

MS, UG, HS Student Supervision

1. (HS) Raymond Shao, *Algorithms for Large Graphs*, June 2021.

2. (UG) Shawn Lee, *Efficient Parallel Sudoku Solver via Thread Management & Data Sharing Methods*, June 2017.

3. (UG) Andy Thio, *High Performance Parallel Sokoban Solver*, June 2017.

4. (HS) Jason Lai, Alta Loma High School, Rancho Cucamonga, Summer 2016.

5. (MS) Bin Wu, *Distributed Out-of-Core Graph Processing*, August 2015.

6. (UG) Sihan He, *TIGRAPH - A Tiny Graph Processing System*, June 2015.
7. (UG) Zhongqi Wang, *TIGRAPH - A Tiny Graph Processing System*, June 2015.
8. (MS) Bryan Duane Rowe II, *An Evaluation of Graph Processing Frameworks*, February 2015.
9. (UG) Joshua Giem, *Hybrid Parallel/Serial Loseless Data Compression on a GPU*, June 2014.
10. (MS) Pengcheng Zhao, *Reducing the Overhead of Dynamic Slicing*, August 2013.
11. (MS) Anton Jouline, *Dynamic Dispatching in Java Programs*, December 1999.
12. (MS) Jun Xu, *Implementation of Branch Sequence Prediction Techniques*, December 1998.
13. (MS) Aston AuYeung, *Extending UPFAST to Support VLIW Architectures*, August 1998.
14. (MS) Vishal Jain, *An Approach for Monitoring Intrusion Removal in Real-Time Systems*, 1997.
15. (MS) Philip Kamp, *Language and Compile-time Analysis Support for Dynamic Data Structures*, December 1995.
16. (MS) Xin Yuan, *Timestamp-based Selective Invalidation Scheme for Multiprocessor Cache Coherence*, August 1995.
17. (MS) Meena Krishnan, *Implementation of Array Data Flow Analysis in the PDGCC Compiler*, December 1994.
18. (MS) Wanqing Wu, *A Simulator for the PDGCC Compiler*, December 1994.
19. (MS) Ed Kuzemchak, *Automatic Test Generation for Testing Ada Compilers*, December 1994.
20. (MS) Ras Bodik, *Optimal Placement of Load-Store Operations for Array Accesses in Loops*, December 1994.
21. (MS) Kishore Karnam, *Automatic Distribution of Data on Distributed Memory Machines*, April 1994.
22. (MS) Radha Sivaramakrishnan, *Static Analysis of Distributed Memory Programs*, Dec. 1993.
23. (MS) Michael Bigrigg, *An Integrated Database Programming Environment for Parallel Applications*, August 1993.
24. (MS) Padmavathi Vallabhaneni, *Analysis and Transformation of Programs for SPMD execution on Distributed-Memory Multiprocessors*, December 1992.
25. (MS) Sunah Lee, *Executing Loops on a Fine-Grained MIMD Architecture*, August 1991.
26. (MS) Robert Kramer, *The Combining DAG: A Technique for Parallel Data Flow Analysis*, 1991.

Ph.D. DISSERTATION COMMITTEE MEMBER

UCR, CSE Department:
(2023) Narges Shadab; Jinyang Liu; Yujia Zhai; Farzin Houshmand;
(2022) Kai Zhao; Ju Chen; Esmaeil Mohammadian Koruyeh; Jinghan Wang; You-Chia Liu;
(2021) Amir N. Sabet; Mohammad Jahanian; Hodjat A. Esfeden; Umar Farooq; Sri Shaila;
(2020) Junqiao Qiu; (2019) Xin Liang; Khaled Khasawneh; Yue Duan; Jieyang Chen;
(2018) Prerna Budhkar; Kenneth O'Neal; Eldon Carman; (2017) Yongjian Hu;
(2016) Panruo Wu; Mehmet E. Belviranli; Tanzirul Azim;
(2015) Mohammad Shokoohi-Yekta; (2014) Dung Vu; Teresa Davies;
(2012) Pamela Bhattacharya; (2011) Guangdeng Liao; (2010) Danhua Guo; (2008) Min Wan.

Georgia Tech., College of Computing: (2023) Christopher Porter; (2006) Xiaotong Zhuang.

University of Arizona, ECE Department: (2002) Haibo Wang; Daler Rakhmatov.

University of Pittsburgh, CS Department:
(2001) Atif Memon; (1998) Chuck Salisbury; (1994) Chyi-Ren Dow.

Carnegie Mellon University, CS Department: (1997) Chris Newburn; (1995) Herman Schmit.

New Jersey Institute of Technology, CS Department: (1996) Mohamed Younis.

TEACHING EXPERIENCE

University of California, Riverside

CS 152: *Compiler Design* – Fall'08; Winter'10,'11,'12,'13,'14,'15,'16,'17,'18,'20,'21; Spring'20,'21,'22; Summer'19,'20,'21,'22,'23,'24.

CS 201: *Compiler Construction* – Winter'08; Spring'09,'10,'11,'12,'13,'14,'15,'16,'18; Fall'16,'18,'19,'20,'21,'22,'23.

CS 206: *Testing and Verification Techniques in Software Engineering* – Fall'09,'11,'12,'15.

CS 203A: *Advanced Computer Architecture* – Winter'09.

CS 260: Seminar: *Parallel Computing* – Spring'15.

CS 260: Seminar: *Multicore Systems* – Winter'11.

CS 260: Seminar: *Advanced Execution Systems for Reliable High-Perf. Computing* – Spring'08.

CS 270: *Special Topics in Advanced CS* – Winter'10,'12,'13,'14,'16; Spring'09,'17; Fall'18.

The University of Arizona

CSc 453: *Compilers and System Software*, Fall'99,'03.

CSc 553: *Principles of Compilation*, Spring'01,'02,'05,'07.

CSc 576: *Computer Architecture*, Fall'00,'01,'02,'03,'04.

CSc 620: *Microarchitecture and Compiler Support for Instruction Level Parallelism*, Spring'00.

CSc 620: *Embedded Systems*, Fall'02.

CSc 620: *Advanced Execution Systems for Reliable Computing*, Fall'06.

University of Pittsburgh

CS2210: *Compiler Design*, Fall'91,'92,'93,'94,'95,'97.

CS2212: *Advanced Compiler Design*, Winter'93,'94,'95.

CS2230: *Compiling Techniques for Parallel Systems*, Fall'93, Winter'96.

CS3210: *Advanced Topics in Programming Languages*, Winter'98,'99.

CS3220: *Seminar on Fine-Grained Parallel Processing Systems*, Winter'91.

CS1622: *Compiler Design*, Winter'91-96, Winter'98,'99.

CS1621: *Structure of Programming Languages*, Fall'90.

CS1520: *Programming Languages*, Fall'98.

CS0441: *Discrete Structures for Computer Science*, Winter'92.

SERVICE

PROFESSIONAL SERVICE

Editorial Boards

- *Frontiers in High Perf. Computing – Parallel and Distributed Software*, 03/2023 – present.
- (PARCO) *Parallel Computing*, North Holland, 1991 – present.
- (COLA) *Journal of Computer Languages*, Elsevier, 2019 – present.
- (TACO) *ACM Transactions on Architecture and Code Optimization*, 2003 – 01/2017.
- (IEEE TC) *IEEE Transactions on Computers*, 2009 – 2014.
- (COMLAN) *Computer Languages, Systems and Structures*, Elsevier, 2006 – 12/2018.
- (JEC) *Journal of Embedded Computing*, 2003 – 2011.
- (IJPDSN) *IASTED Intl. Journal of Parallel and Distributed Systems and Networks*, 1996-2002.

Guest Editor

- (TECS) *ACM Transactions on Embedded Computing Systems*, special issue of on Language, Compiler, and Tool Support for Embedded Systems, Vol. 6, No. 4, September 2007.

Steering Committee Chair

- (FCRC 2016-2019) *ACM Federated Computing Research Conference*.
- (ASPLOS 2012-2013) *SIGPLAN/SIGOPS International Conference on Architectural Support for Programming Languages and Operating Systems*.
- (LCTES June 2006-September 2009) *ACM SIGPLAN Conference on Language, Compiler, and Tool Support for Embedded Systems*.

General Chair

- (PACT 2024) *The 33rd International Conference on Parallel Architectures and Compilation Techniques*, Southern California (Co-Chair with Nael Abu-Ghazaleh).
- (ASPLOS 2024) *ACM SIGPLAN/SIGOPS International Conference on Architectural Support for Programming Languages and Operating Systems*, San Diego, California (Co-Chair with Nael Abu-Ghazaleh).
- (PPoPP 2020) *ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming*, San Diego, California.
- (FCRC 2015) *ACM Federated Computing Research Conference*, Portland, Oregon.
- (ASPLOS 2011) *ACM SIGPLAN/SIGOPS International Conference on Architectural Support for Programming Languages and Operating Systems*, Newport Beach, California.
- (PLDI 2008) *ACM SIGPLAN Conference on Programming Language Design and Implementation*, Tucson, Arizona.
- (CGO 2005) *IEEE/ACM International Symposium on Code Generation and Optimization*, San Jose, California (Co-Chair with Jesse Z. Fang).

Program Chair

- (CC 2021) *International Conference on Compiler Construction* (Co-Chair: Delphine Demange).
- (AGP 2017) *First International Workshop on Architecture for Graph Processing*, held in conjunction with ISCA, (Co-Chair with Xuehai Qian).
- (ICESS 2014) Track Chair, Design Methodology and Tools, *IEEE International Conference on Embedded Software and Systems*.
- (CC 2010) *International Conference on Compiler Construction*.
- (HiPEAC 2008) *International Conf. on High-Performance Embedded Architectures and Compilers*. (Co-Chair with Minolis Katevenis)
- (LCTES 2005) *ACM SIGPLAN Conference on Language, Compiler, and Tool Support for Embedded Systems*.
- (PLDI 2003) *SIGPLAN Conference on Programming Language Design and Implementation*.
- (HPCA 2003) *IEEE International Symposium on High Performance Computer Architecture*.
- (HiPC 2003) Program Vice-Chair, Computer Architecture Track, *International Conference on High Performance Computing*.
- (ADCOM 2000) *Advanced Computing and Communication*. (Co-Chair with B.P. Sinha).
- (Dagstuhl Seminar) *Code Optimisation: Trends, Challenges, and Prespectives*, Dagstuhl, Germany, 2000 (Co-Chair with Jens Knoop, Carole Dulong, and Robert Kennedy).
- *First Workshop on Profile and Feedback-Directed Compilation*, held in conjunction with PACT, 1998 (Co-Chair with Brad Calder and James Larus).
- (LCT-RTS 1997) *ACM SIGPLAN Workshop on Language, Compiler, and Tool Support for Real-Time Systems*, held in conjunction with PLDI, (Co-Chair with David Whalley).

Registration Chair

- (PACT 2005) *International Conference on Parallel Architectures and Compilation Techniques*.

Workshops Chair

- (ASPLOS 2018) *ACM International Conference on Architectural Support for Programming Languages and Operating Systems* (Co-Chair with Zhijia Zhao).
- (ICS 2002) *ACM International Conference on Supercomputing*.

Steering Committee Member

- (CC 2021–) *SIGPLAN International Conference on Compiler Construction*.
- (PPoPP 2020–) *ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming*.
- (FCRC 2019–) *ACM Federated Computing Research Conference*.
- (ASPLOS 2011-2012) *ACM International Conference on Architectural Support for Programming Languages and Operating Systems*.
- (ETAPS 2010-2011) *The European Joint Conferences on Theory and Practice of Software*.
- (PLDI 2003-2005,2007-2010) *ACM SIGPLAN Conference on Programming Language Design and Implementation*.
- (HiPEAC 2005-2009) *Intl Conf. on High-Performance Embedded Architectures and Compilers*.

- (HPCA 2003) *IEEE International Symposium on High Performance Computer Architecture.*
- (LCTES 2000-2010) *ACM SIGPLAN Conference on Language, Compiler, and Tool Support for Embedded Systems* (Member-at-large 2003-2005).

Selection Committee Member

- SIGMICRO Research Highlights Committee [2022].
- (IEEE Fellows), Member of IEEE CS Fellows Evaluation Committee [2008, 2009, 2010, 2012, 2013, 2014, 2015, 2020, 2021, 2023].
- (Most Influential PLDI 2008 Paper Award), Member of the Selection Committee [2018].
- (Most Infuential PLDI 2003 Paper Award), Member of the Selection Committee [2013].
- (Most Infuential PLDI 1994 Paper Award), Member of the Selection Committee [2004].
- (Test of Time Award from CGO 2005), Member of the Selection Committee [2015].

Program Committee Member

Programming Languages and Compilers

- (OOPSLA) *ACM SIGPLAN OOPSLA Conference* [2024].
- (PPoPP) *ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming* [2024, 2012].
- (POPL) *ACM SIGACT/SIGPLAN Symposium on Principles of Programming Languages* [2006].
- (PLDI) *ACM SIGPLAN Conference on Programming Language Design and Implementation* [2002, 1994].
- (PPPJ) *International Conference on the Principles and Practice of Programming on the Java Platform* [2014].
- (CGO) *IEEE/ACM International Symposium on Code Generation and Optimization* [2021, 2020, 2011, 2010, 2006, 2004, 2003].
- (CC) *International Conference on Compiler Construction* [2017, 2007, 1998, 1996, 1994].
- (ICCL) *IEEE International Conference on Computer Languages* [1998].
- (APLAS) *The ASIAN Symposium on Programming Languages and Systems* [2011, 2008].
- (ISMM) *International Symposium on Memory Management* [2019, 2011].
- (EXADAPT) *Second International Workshop on Adaptive Self-tuning Computing Systems for the Exaflop Era* [2012, 2011].
- (COCV) *International Workshop on Compiler Optimization Meets Compiler Verification* (with ETAPS) [2004, 2002].
- (PEPM) *ACM SIGPLAN Workshop on Partial Evaluation and Sematics based Program Manipulation* (with PLDI) [2003].
- (MSP) *Workshop on Memory System Performance* (with PLDI) [2002].

Computer Architecture

- (ASPLOS) *ACM International Conference on Architectural Support for Programming Languages and Operating Systems* [2025, 2018].

- (MICRO) *IEEE/ACM International Symposium on Microarchitecture* [2024, 2023, 2021, 2020, 2018, 2006, 2005, 2004, 2003, 2002, 2001, 2000, 1995].
- (ISCA) *ACM/IEEE International Symposium on Computer Architecture* [2024, 2022, 2012, 2007].
- (HPCA) *IEEE International Symposium on High Performance Computer Architecture* [2008, 2006, 2005].
- (Top Picks) *IEEE Micro's Top Picks* from Computer Architecture Conferences [2007, 2005].
- (ICS) *ACM International Conference on Supercomputing* [2023, 2004, 2003, 2001].
- (PACT) *International Conference on Parallel Architectures and Compilation Techniques* [2020, 2017, 2010, 2009, 1998, 1997, 1996, 1994].
- (ISPASS) *IEEE International Symposium on Performance Analysis of Systems and Software* [2024, 2023, 2022, 2019, 2011, 2008, 2003].
- (HiPEAC) *International Conf. on High-Performance Embedded Architectures and Compilers* [2010, 2007, 2005].
- (HPPC) *Workshop on Hardware-support for Parallel Program Correctness* [2011].
- (INTERACT) *Workshop on Interaction Between Compilers and Computer Architectures* [2012, 2011, 2010].
- (M2A2) *International Workshop on Multicore and Multithreaded Architectures and Algorithms* [2015, 2014, 2013, 2012, 2011, 2010].
- (PESPMA) *Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures* (with ISCA) [2010, 2009].
- (SAMOS) *International Workshop on Systems, Architectures, Modeling, and Simulation* [2009, 2008].
- (RAAW) *Workshop on Reconfigurable and Adaptive Architectures* (with MICRO) [2007, 2006].
- (COLP) *Workshop on Compilers and Operating Systems for Low Power* (with PACT) [2003, 2002, 2001, 2000].
- (VPW) *Value Prediction Workshop* (with ISCA) [2003].
- (SSRS) *Workshop on Software Support for Reconfigurable Systems* (with HPCA) [2003].

Parallel & Distributed Computing

- (ICDCS) *International Conference on Distributed Computing Systems*, Distributed Big Data Systems and Analytics Track [2024, 2023, 2022].
- (IEEE BigData) IEEE International Conference on Big Data [2024].
- (IA^3) *7th Workshop on Irregular Applications: Architectures and Algorithms* (with SC) [2023, 2022, 2021, 2020, 2019, 2018, 2017].
- (CCGrid) *IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing* [2015].
- (IPDPS) *IEEE International Parallel ang Distributed Processing Symposium* [2014, 2013].
- (HPCC) *IEEE International Conf. on High Performance Computing and Communications* [2016, 2015].
- (ICPADS) *IEEE International Conference on Parallel and Distributed Systems* [2015, 2014, 2013, 2011].
- (HiPC) *High Performance Computing Conference* [2013].

- (PDCN) *Parallel and Distributed Computing and Networks* [2006, 2004].
- (ICPP) *International Conference on Parallel Processing* [2015, 2003].
- (PDCS) *International Conference on Parallel and Distributed Computing Systems* [2000, 1998, 1997, 1992].

Software Engineering

- (QRS) *IEEE International Conference on Software Quality, Reliability, and Security* [2021, 2020, 2019, 2018, 2017, 2016, 2015].
- (ICSME) *IEEE International Conference on Software Maintenance and Evolution* [2014].
- (ICSM) *IEEE International Conference on Software Maintenance* [2013].
- (QSIC) *International Conference on Quality Software* [2014, 2013, 2012, 2011, 2010].
- (RV) *International Conference on Runtime Verification* [2011, 2010].
- (PASTE) *ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering* [2008, 1998].
- (WODA) *Tenth International Workshop on Dynamic Analysis* [2015, 2014, 2012].
- (REGRESSION) *The Second International Workshop on Regression Testing* [2012].
- (Compute) *ACM Compute Conference* [2008].
- (DASC) *IEEE Intl Conf. on Dependable, Autonomic and Secure Computing* [2014].
- (ICSOFT) *International Conference on Software and Data Technologies* [2006].
- (eTX) *eclipse Technology eXchange Workshop* (with OOPSLA) [2003].

Embedded Systems

- (LCTES) *ACM SIGPLAN Conference on Languages, Compilers, and Tools for Embedded Systems* [2020, 2014, 2013, 2004].
- (LCTES/SCOPES) *ACM SIGPLAN Joint Conference on Languages, Compilers, and Tools for Embedded Systems & Software and Compilers for Embedded Systems* [2002].
- (CASES) *International Conf. on Compilers, Architectures and Synthesis for Embedded Systems* [2016, 2015, 2014, 2013, 2012, 2011, 2010, 2008, 2006, 2005, 2004, 2002, 1998].
- (SAMOS) *International Conference on Embedded Computer Systems: Architectures, Modeling, and Simulation* [2021, 2020, 2019, 2018, 2016, 2015, 2014, 2013, 2012, 2011, 2010].
- (DATE) *Design, Automation and Test in Europe* [2007].
- (SAC) *ACM Symp. on Applied Computing* [2018, 2016, 2015, 2014, 2013, 2012, 2011, 2010].
- (ICESS) *IEEE International Conference on Embedded Software and Systems* [2013, 2012, 2011, 2010, 2009].
- (RTCSA) *IEEE International Conference on Embedded and Real-Time Computing Systems and Applications* [2013, 2010, 2009].
- (ESA) *IEEE International Symposium on Advanced Topics on Embedded Systems and Applications* [2011].
- (EUC) *International Conference on Embedded And Ubiquitous Computing* [2004].
- (FutureTech) *International Conference on Future Information Technology* [2012, 2010].

- (LCTES) *ACM SIGPLAN Workshop on Languages, Compilers, and Tools for Embedded Systems* (with PLDI) [2001, 1998].
- (LCT-RTS) *ACM SIGPLAN Workshop on Language, Compiler, and Tool Support for Real-Time Systems* (with PLDI) [1995].
- (SCOPES) *International Workshop on Software and Compilers for Embedded Systems* [2004, 2003].
- (WESAPEC) *International Workshop on Embedded System Architectures for Pervasive Devices and Computers* (with IPC) [2007].
- (SoC) *International Workshop on SoC and MCSoC design* (with MoMM) [2006].
- (EC) *International Workshop on Embedded Computing* [2006].
- (CTCES) *Workshop on Compilers and Tools for Constrained Embedded Systems* (with CASES) [2005, 2004, 2003].
- (ECS) *International Workshop on Embedded Computing Systems* (with ICDCS) [2004].
- (LARTES) *IEEE Workshop on large Scale Real-Time and Embedded Systems* (with RTSS) [2002].

External Review Committee Member

- (ISCA) *ACM/IEEE International Symposium on Computer Architecture* [2023, 2015].
- (PLDI) *ACM SIGPLAN Conference on Programming Language Design and Implementation* [2015, 2014, 2013, 2010].
- (MICRO) *Annual IEEE/ACM International Symposium on Microarchitecture* [2022, 2014, 2012].
- (ASPLOS) *ACM International Conference on Architectural Support for Programming Languages and Operating Systems* [2023, 2020, 2016, 2015, 2012].
- (POPL) *ACM SIGACT/SIGPLAN Symposium on Principles of Programming Languages* [2012].

Membership

- ACM (Fellow & Lifetime Member); IEEE (Fellow); AAAS (Fellow).
- Member – SIGPLAN, SIGSOFT, SIGARCH, SIGMICRO, HiPEAC (Associate).

Other Refereeing and Reviewing

- **(Proposals)** NSF Panels for Programs – PPoSS, Expeditions in Computing, XPS, CSR, CCF, CNS, CAREER, Compilers, Computer Architecture, and ITR; DOE; Fonds Wetenschappelijk Onderzoek - Vlaanderen, Beligium; Fonds National de la Recherche, Luxembourg; The Knowledge Foundation, Sweden; Austrian Science Fund; Science Foundation, Ireland; UKIERI, British Council; NSERC Canada; University Grants Council of Hong Kong; UCMEXUS Review Panel; and UC Discovery Review Panel.
- **(Journals)** ACM TOSEM, ACM TOPLAS, ACM TECS, ACM TACO, ACM TODAES, ACM LOPLAS, IEEE TPDS, IEEE TSE, IEEE TC, IEEE Computer, IEEE Software, IEEE Micro, IEEE PDT, CACM, SP&E, JPDC, IJPP, Parallel Computing, J. Supercomputing, JSTVR, and JPL.
- **(Conferences)** SIGPLAN-SIGACT POPL, SIGPLAN PLDI, IEEE/ACM MICRO, ACM ASPLOS, IEEE/ACM ISCA, IEEE HPCA, ACM ICS, IEEE ICCL, CC, PEPM, CGO, ISPASS, PACT, FDDO, LCTES, CASES, SCOPES, LCPC, COLP, ISSRE, IEEE SRDS, IEEE IPPS, ICPP, HiPC, PARLE, DMCC, PDCS, Supercomputing, ICPADS, and IEEE SPDP.
- **(Others)** PhD Dissertations – SIGPLAN Doctoral Dissertation Award Nominees; Video Lectures – University Video Communications; and Book – IEEE Computer Society.

UNIVERSITY SERVICE

University of California, Riverside

Campus

UCR Provost Search Advisory Committee, 10/2019 – 6/2020.

UCR Vice Provost for Academic Personnel Search Advisory Committee, 4/2020 – 6/2020.

UCR Executive Council, 9/2018 – 8/2019.

University Committee on Academic Personnel (UCAP), 9/2017 – 8/2018.

UCR Committee on Academic Personnel (CAP), 9/2016 – 8/2019:
Member 9/2016 – 8/2017;
Vice Chair 9/2017 – 8/2018;
Chair 9/2018 – 8/2019.

VPIA's Scholars-at-Risk Coordinating Committee, 10/2022 – present.

UCR Shadow Committee on Academic Personnel (Shadow CAP), 09/2020 – 08/2022.

UCR Joint Senate-Administrative Teaching Evaluation Implementation Committee, 01/2022 – 08/2022.

UCR Committee on Faculty Welfare, 10/2020 – 08/2022.

UCR Privelage and Tenure Committee (P&T), 2011 – 2013.

UCR Grievance Consultation Panel (GCP), 09/2016 – 08/2019.

UCMEXUS Review Panel, 2012.

UC Discovery Review Panel, 2011.

College of Engineering

Associate Dean for Academic Personnel, Bourns College of Engineering, 7/2022 – $\sim$.

BCOE Strategic Planning Committee, 2020.

Chair, Research Committee, Bourns College of Engineering Retreat, 2008.

Retreat Oversight Committee, Bourns College of Engineering, 2008 – 2009.

Computer Science and Engineering Department

CSE Vice Chair *for Graduate Affairs*, 7/2021 – 6/2022.

Faculty Graduate Advisor, 8/2019 – 6/2022.

Chair, CSE, Graduate Advisory Committee, 8/2019 – 6/2022.

Chair, CSE Recruiting Committee, 2012 – 2014.

CSE Recruiting Committee, 2008 – 2012, 2015, 2019, 2021.

CSE Ad hoc Graduate Curriculum Review Committee, Winter 2019.

CSE, Graduate Admissions Committee, 2010 – 2012.

CSE, Graduate Program/Advisory Committee, 2015 – 2018.

Executive Committee, CSE Department, 2007 – 2022.

University and Department Level AdHoc Committees for Peer Evaluations, 2007 – 6/2022.

CSE, Research Committee, 2007 – 2008.

CSE, Resource/Publicity Committee, 2008 – 2009.

Computer Engineering Program

Chair, CEN Strategic Plan Committee, 2018 – 2019.

CEN PhD Program Proposal Preparation Committee, 2019 – 2020.

CEN Recruiting Committee, 2013 – 2015.

The University of Arizona

Self-Study Team for Academic Program Review, *Member*, 2006 – 2007

Advisory Committee, *Member Elected by the Faculty*, 2006 – 2007.

Five Year Review Committee of Department Head, *Member Appointed by the Dean*, 2003.

Steering Committee, Research Infrastructure Grant: **Chair**, 2003-2005; *Member*, 2001 – 2002.

Graduate Admissions Committee: **Chair**, 2000 – 05/2005, 09/2006 – 2007; and *Member*, 1999.

Graduate Affairs Committee, *Member*, 2006 – 2007.

Space Planning Committee, *Member*, 2004.

Colloquium Czar, 2001 – 2002.

Human Subjects Review Committee, **Chair**, 2003 – 2005.

Promotion and Tenure Committee, *Member*, 1999 – 2001 and 2002 – 2005.

PhD Qualifiers Committee, 2001 – 2002.

University of Pittsburgh

Computer Engineering Program Proposal Committee, *Member*, 1995.

Committee on the University of Pittsburgh's Presentation on the Internet, 1995.

Faculty of Arts and Sciences Tenure Review Committees, **Chair** & *Member*, 1998 & 1999.

Faculty of Arts and Sciences Tenure Council, *Member*, 1994, 1995 and 1998

Faculty Recruiting Committee, *Member*, 1990 – 1991.

Graduate Programs and Exams Committee, *Member*, 1991 – 1993.

Graduate Admissions and Financial Aid Committee, *Member*, 1992 – 1993 and 1998 – 1999.

TA/TF Training and Evaluation Committee, *Member*, 1994 – 1995.

Computing and Communications Committee, *Member*, 1994 – 1999.

Web Administrator for the Computer Science Department, 1994 – 1999