Margaret R. Martonosi

Computer Science Bldg, Room 208
35 Olden St.
Princeton, NJ 08540

Email: martonosi@princeton.edu
Phone: 609-258-1912
http://www.princeton.edu/~mrm

Hugh Trumbull Adams '35 Professor of Computer Science, Princeton University

Associated faculty: Dept. of Electrical and Computer Engineering; Princeton High Meadows Environmental Institute, Center for Information Technology Policy, Andlinger Center for Energy and the Environment.

Research areas: Computer architectures and the hardware/software interface, in both classical and quantum computer systems.

Major Research Recognition:

Member, National Academy of Engineering

Member, American Academy of Arts and Sciences

2021 IEEE/ACM Eckert-Mauchly Award. "For contributions to the design, modeling, and verification of power-efficient computer architecture". This is the top award for lifetime research achievement in the field of computer architecture.

IEEE Fellow. "For contributions to power-efficient computer architecture and systems design"

ACM Fellow. "For contributions in power-aware computing"

2016-2022: Andrew Dickson White Visiting Professor-At-Large. Cornell University. Roughly twenty people worldwide are extended this title based on their professional stature and expertise, and are considered full members of the Cornell faculty during their six-year term appointment.

2018 IEEE Computer Society Edward J. McCluskey Technical Achievement Award

2015-2016: Jefferson Science Fellow, U.S. Department of State. One of 11 tenured STEM professors selected for one-year fellowships on international technology policy.

2015 Marie R. Pistilli Women in EDA Achievement Award

2013 Anita Borg Institute ABIE Technical Leadership Award

Executive Leadership Experience:

2/2020-12/2023: Assistant Director for Computer and Information Science and Engineering (CISE), US National Science Foundation.

- My role was to lead the CISE Directorate, leading technical and budget strategy for an organization with $1B annual budget and ~150 headcount, with the mission of catalyzing computing research, education, and infrastructure across the nation.
- During my tenure, numerous major programs were launched, including 25 National AI Research Institutes ($20M investments apiece) and the CI Fellows post-doc program to navigate research job market shocks related to the COVID-19 pandemic.
- During my tenure, the CISE organization was named one the best places to work in the Federal government. In particular, we were ranked 4th out of 432 government subcomponents based on the annual FEVS survey responses. https://www.washingtonpost.com/business/interactive/2023/top-workplaces-federal-government/

7/2017-1/2020: Director, Princeton University Keller Center for Innovation in Engineering Education

- My role was to lead an interdisciplinary center with a roughly $10M annual budget and faculty/staff headcount of roughly 20 people.
- Despite its relatively small size, Keller had one of the heaviest teaching headcounts at Princeton. I advocated for and achieved FTE increases to support outstanding classroom experiences and faculty retention in the centeer.
- One of Keller's roles is as the pedagogical home for entrepreneurship and design thinking education at Princeton. During my tenure we advocated for the creation of "professor of the practice" career pathways at Princeton to account for the expertise of seasoned entrepreneurs on Keller's teaching faculty. This track is now in place.

7/2005-7/2007: Associate Dean for Academic Affairs, School of Engineering and Applied Science.

- Coordinate SEAS FTE counts, and allocation to service courses and other uses
- Pioneered a Dean's Commendation List for Teaching Excellence to honor successful classroom teaching

Service and Mentoring Awards:

2024 ACM Francis E. Allen Award for Outstanding Mentoring. For "outstanding and far-reaching mentoring in computer architecture, and to the broader CS community"

2020 Computing Research Association Distinguished Service Award given to ACM SIGARCH/SIGMICRO CARES, of which I was a founding co-chair in 2018.

2019 ACM SIGARCH Alan D. Berenbaum Distinguished Service Award. For "outstanding leadership in recruiting, retaining, and advancing women and under-represented minorities and raising awareness of the importance of diversity to the computer architecture community."

2019 Semiconductor Research Consortium (SRC) Aristotle Award. National award for graduate mentoring.

National Council of Women in Technology (NCWIT) & AT&T Undergraduate Research Mentoring Award. May, 2013

Princeton University Graduate Mentoring Award. May, 2010. (Four given out each year, one per university division.)

Long-term Influential Paper "Test of Time" awards:

- 2023 International Symposium on Computer Architecture. *Four papers from my research group included in ISCA's 50th anniversary retrospective volume.*
- 2022 ACM SIGMICRO Test of Time award. *For 2003 paper entitled "Runtime Power Monitoring in High-End Processors: Methodology and Empirical Data" by Isci and Martonosi*
- 2021 International Symposium on Computer Architecture Long-term Influential Paper Award honoring *2006 paper entitled "Techniques for Multicore Thermal Management" by Donald and Martonosi.*
- 2021 IEEE International Symposium on High-Performance Computer Architecture Test of Time award, *honoring the long-term impact of our HPCA 2001 paper entitled "Dynamic Thermal Management for High-Performance Microprocessors". "This highly cited seminal HPCA paper opened the field of thermal-aware architecture research and was the first to make the distinction between power-aware and thermal-aware architecture. Dynamic thermal management, inspired by this paper, is now essentially universal in computer systems today, proliferating from server processors to mobile SoCs."*

- 2020 ACM International Conference on Architecture Support for Programming Languages and Operating Systems (ASPLOS) Long-term Influential Paper award, *honoring the long-term impact of our ASPLOS 2002 paper entitled "Energy-Efficient Computing for Wildlife Tracking: Design Tradeoffs and Early Experiences with ZebraNet".*
- 2018 IEEE International Conference on High-Performance Computer Architecture Test-of-Time Paper award, *honoring the long-term impact of our HPCA-5 (1999) paper entitled "Dynamically Exploiting Narrow Width Operands to Improve Processor Power and Performance"*
- 2017 ACM SenSys Test-of-Time Paper award, *honoring the long-term impact of our SenSys 2004 paper entitled "Hardware Design Experiences in ZebraNet".*
- 2017 ACM SIGMOBILE Test-of-Time Paper Award, *honoring the long-term impact of our ASPLOS 2002 paper entitled "Energy-Efficient Computing for Wildlife Tracking: Design Tradeoffs and Early Experiences with ZebraNet".*
- 2015 ACM IEEE International Symposium on Computer Architecture Long-term Influential Paper Award, *honoring the long-term impact of our ISCA 2000 paper entitled "Wattch: A Framework for Architectural-Level Power Analysis and Optimizations".*
- One of the 25 Most Significant Papers from the first 20 years of FCCM. *"Accelerating Boolean Satisfiability with Configurable Hardware.", by Peixin Zhong, Margaret Martonosi, Pranav Ashar, and Sharad Malik. FCCM 1998. (Recognized at FCCM 2013).*

Best Paper awards:
- Quantum Computing Track for the *2020 IEEE International Conference on Quantum Computing and Engineering (QCE).*
- *49th Annual International Symposium on Microarchitecture.* Taipei, Taiwan. November, 2016.
- *Ninth International Conference on Mobile Systems, Applications, and Services (MobiSys).* Washington, DC. June, 2011.
- *First International Green Computing Conference (IGCC'10) (IEEE). Chicago, IL.* August, 2010.
- *38th Annual International Symposium on Microarchitecture.* Barcelona, Spain. November, 2005.
- Multiple papers selected for inclusion in "**Top Picks in Computer Architecture**." IEEE Micro. 2006-present.
- ZebraNet II hardware chosen as **Design Contest winner** at 2003 Intl. Symposium on Low-Power Electronics and Design (ISLPED). August, 2003.

Princeton University Awards:

Princeton University Graduate Mentoring Award. May, 2010. (Four given out each year, one per university division.)

School of Engineering Commendation List for Outstanding Teaching, Fall '06 (ELE475, Computer Architecture); Fall '07 (ELE475, Computer Architecture), Spring '08 (ELE583, Great Moments in Computing), Spring '09 (ELE583, Great Moments in Computing). Fall '10 (ELE580A, Green Information Technology). Spring '15 (ELE583, Great Moments in Computing).

Princeton University 250th Anniversary Fund for Innovation in Undergraduate Education. In 2000, for curriculum development related to an introductory programming course on handheld devices. In 1997, for curriculum development related to an undergraduate course in Configurable Computing.

Princeton University School of Engineering Howard B. Wentz Award. 1998. ("Recognizing excellence in teaching and scholarship")

PROFESSIONAL EXPERIENCE

9/1994-Present   Faculty at Princeton University.
- 2012-<u>present</u> Hugh Trumbull Adams '35 Endowed Chair in Computer Science
- 2010-2012: Full Professor, Dept. of Computer Science, with affiliated status in ECE
- 2004-2010: Full Professor, Dept. of Electrical Engineering, with affiliated status in CS
- 2000-2004: Assoc. Professor, Dept. of Electrical Engineering, with affiliated status in CS
- 1994-2000: Assistant. Professor, Dept. of Electrical Engineering, with affiliated status in CS

2/2020-12/2023   **Assistant Director** for the Computer and Information Science and Engineering (CISE) Directorate, National Science Foundation. ~4-year term served as an IPA rotator on leave from Princeton. Led a directorate with $1B annual budget and 150 staff members. Led budget strategy and visioning in service of major funder of CS academic research across the US. Subsequent twelve months as a part-time expert consultant.

7/2017-1/2020   **Director**, Keller Center for Innovation in Engineering Education

8/2015- 8/2016   **Jefferson Science Fellow**, US Department of State. (1-year sabbatical doing tech policy in State Department's International Communications and Information Policy office. Subsequent six months as a part-time expert consultant.

1/2011-1/2012   **Acting Director**. Center for Information Technology Policy.

7/2005-7/2007   **Associate Dean for Academic Affairs**, School of Engineering and Applied Science.

1/2005-7/2005   **Visiting Scholar** (sabbatical) Dept. of Computer Science and Engineering, University of Washington.

6/2004-12/2004   **Research Staff Member and Academic Visitor** (sabbatical) IBM T.J. Watson Research Center.

EDUCATION

Stanford University. Ph.D. in Electrical Engineering. Completed December, 1993. Conferred 1994.

   Dissertation: Analyzing and Tuning Memory Performance in Sequential and Parallel Programs.
   Advisors: Professors Anoop Gupta and Thomas E. Anderson

Stanford University. Master of Science in Electrical Engineering, September, 1987.

Cornell University. Bachelor of Science in Electrical Engineering with Distinction, June, 1986.

GRANTS

2020-present   **US Department of Energy Co-Design Center for Quantum Advantage (C2QA).**

2018-2024   **DARPA Software-Defined Hardware Program.** The DECADES Project: Deeply-Customized Accelerator-Oriented Data Supply Systems Synthesis

2018-2023	**National Science Foundation Expedition in Computing**. EPiQC: Enabling Practical-Scale Quantum Computation. PI transferred to Houck due to NSF CISE AD.
2018-2021	**National Science Foundation SHF**. Decentralized On-Chip Infrastructure for Robustness and Portability in Heterogeneous Multicores. PI transferred to Tureci due to NSF CISE AD.
2017-2020	**National Science Foundation CPS.** Towards Secure, Privacy-Preserving, Verifiable Cyberphysical Systems. PI transferred to Tureci due to NSF CISE AD.
2017-2019	**SRC JUMP Center on Applications Driving Architectures.** Co-PI and Communications theme leader.
2015-2018	**National Science Foundation XPS.** Verification and Optimization Tools for Heterogeneous Memory Consistency Models.
2013-2017	**DARPA/MARCO STARNet program. C-FAR Center on Future Architectures Research.** Co-PI and Communications theme leader.
2013-2017	**DARPA PERFECT Program.** ESP: Embedded Scalable Platforms for Terascale Energy-Efficient Computing. (Collaborative with Columbia University and University of California, Berkeley).
2011-2014	**National Science Foundation Cyberphysical Systems:** Efficient Mapping and Management of Applications onto Cyber-Physical Systems. (Collaborative with Prof. Pei Zhang, CMU).
2011-2014	**National Science Foundation CCF-SHF:** ShapeShifting and PubSub for Tailoring Memory Accesses and Communication in Heterogeneous Multiprocessors. (Collaborative with Prof. Kevin Skadron, Virginia).
2011-2014	**IARPA:** Aggressive Optimization and Resource Estimation of Next-Generation Quantum Computing Systems.
2009-2012	**National Science Foundation CNS-CSR:** System Support for Managing Carbon Footprints and Electricity Costs in Internet Services.
2009-2012	**National Science Foundation CCF-SHF** SISA: A System-Level ISA for Power-Performance Management in CMPs.
2008	**Google Corporation**. Data-Center-Level Power/Performance Management.
2007-2010	**National Science Foundation CSR-EHS**: Cross-System Modeling and Management for Variation-Adaptive Computing. Joint with Marculescu (CMU).
2006-2010	**National Science Foundation CSR-EHS**: A Space and Resource Aware Computing Architecture for Dynamic Networks. Joint with Peh and Ulrich Kremer (Rutgers).
2006-2010	**National Science Foundation CT**: Well-Typed Trustworthy Computing in the Presence of Transient Faults. Joint with Walker, August, Clark, and Appel. (COS).
2005-2010	**National Science Foundation.** Flow-Based Computer Systems Support for Synergistic Hardware-Software Management of Embedded Systems. Co-PI. (PI is Peh. Other co-PIs are August, Li).
2005-2009	**DARPA/MARCO:** A Proposal for Collaborative Research in the Design, Verification, and Test of Integrated Gigascale Systems: The GigaScale Systems Research Center.
2006-2009	**Princeton Institute for International and Regional Studies (PIIRS).** School of Engineering and Applied Science: Technology for Developing Regions. Martonosi is PI. (Joint with Celia (CEE) and Rubenstein (EEB).)
2005-2009	**Intel Corporation**. Dynamic Compiler-time Energy and Power Control for Intel Processors. Co-PI. (PI is Clark).

2004-2006	**National Science Foundation**. Joint EU/US program for international collaboration. Supplement to NSF ITR grant: Designing "Real-Power" Systems: Static and Dynamic Techniques for Managing Power / Performance Tradeoffs. Principal investigator.
2004-2006	**National Science Foundation.** Adaptive, Power-Efficient Processors for Sensors and Embedded Systems. PI. (Co-PI is Clark)
2003-2005	**National Science Foundation.** Spin-Based Quantum Computing Using Electrons on the Surface of Liquid Helium: Physics and Computer Architecture. Co-Principal Investigator. (PI is Lyon.)
2003-2006	**Intel Corporation**. Power/Performance Modeling for Java-based XScale Systems. Principal investigator.
2003-2006	**Semiconductor Research Corporation.** Adaptively-Controlled Execution for Power and Performance. Principal Investigator.
2002	**IBM University Partnership Award.** For research in power-aware computing.
2002-2005	**National Science Foundation**. Information Technology Research Initiative (Medium-Scale program) ZebraNet: Position-Aware, Power-Aware Wireless Computing for Wildlife Tracking. Principal investigator. (Co-PIs are Poor, Peh and Rubenstein, Ecology and Environmental Biology).
2001-2006	**National Science Foundation CISE Research Infrastructure Award**. Pervasive Computing: Applications and Systems. Co-principal Investigator. (PI is Dobkin, CS. Other Co-Pis are Felten, Li, and Peterson, CS).
2001	**IBM University Partnership Award**. For research in power-aware computing.
2000-2003	**National Science Foundation**. Information Technology Research Initiative. Designing "Real-Power" Systems: Static and Dynamic Techniques for Managing Power / Performance Tradeoffs. Principal investigator. (Co-Pis are Malik and Clark, CS).
2000	**IBM University Partnership Award.** For research in power-aware computing.
2000-2003	**National Science Foundation.** Instrumentation Support for System-on-a-chip and Embedded System Research. Principal investigator.
2000-2003	**Intel Corporation**. Power-Aware Organizational Tradeoffs in High-Performance Processors. Principal investigator.
1999-2004	**New Jersey Commission on Science and Technology.** Center for Embedded System-on-a-chip Design. Co-principal investigator.
1999	**Microsoft Corporation**. Compile-Time and Run-Time Techniques for Program Customization. Principal investigator.
1997-2000	**Intel Corporation**. Power-Aware Organizational Tradeoffs in High-Performance Processors. Principal investigator. (with Prof. Douglas W. Clark, CS).
1997	**NEC C&C Research Labs**. For configurable computing. Principal investigator.
1997-2000	**National Science Foundation**. Principal Investigator. Applications and Tools for Configurable Computing in Sequential and Parallel Computers.
1997-2000	**DARPA ITO**. Principal Investigator. Performance and Synthesis Tools for Adaptive Computing.
1995-1998	**National Science Foundation Faculty Early Career Development (CAREER) Award**. Principal Investigator. An Integrated Hardware and Software Performance Monitoring System.

1995-1999	**National Science Foundation**. Co-Principal Investigator. SHRIMP: Architectural and Systems Support for Inexpensive, High-Performance Multicomputers.
1995-1997, 2006-7	**NSF/Computing Research Association Distributed Mentoring Project**. Summer funding for research with 1-2 women undergraduates per summer from other schools

PATENTS

Granted 2014	*Inter-core Cooperative TLB Prefetchers*. With Abhishek Bhattacharjee. US Patent #8880844. (Also, #9,524,232 in 2016)
Granted 2008	*Method and Apparatus for Reducing Leakage Power in a Cache Memory using Adaptive Time-Based Decay*. With Zhigang Hu, Stefanos Kaxiras. US Patent #7472302.
Granted 2004.	*System and method of operand value based processor optimization by detecting a condition of pre-determined number of bits and selectively disabling pre-determined bit-fields by clock gating*. With David Brooks. <u>Licensed to Intel Corp. (non-exclusive).</u> US Patent #6,745,336.
Granted 2002.	*Method and Apparatus for SAT Solver Architecture with Very Low Synthesis and Layout Overhead*. With P. Ashar, P. Zhong. US Patent #6,415,430
Granted 2001.	*An Edge-Endpoint-Based Configurable Hardware Architecture for VLSI CAD Layout Design Rule Checking*. With P. Ashar, Z. Luo. US Patent #6,324,673.
Granted 2001.	*Configurable Hardware System Implementing Boolean Satisfiability and Method Thereof*. With P. Ashar, S. Malik, P. Zhong. US Patent #6,247,164.
Granted 2000.	Implementation of Boolean Satisfiability with Non-Chronological Backtracking in Configurable Hardware. With P. Ashar, S. Malik, P. Zhong. US Patent #6,038,392.

ARCHIVAL PUBLICATIONS

According to Google Scholar on January 23, 2024, my publications have received a total of 34,129 citations, with an h-index of 83.

BOOKS

National Academies Consensus Study Report: Quantum Computing: Progress and Prospects (2018). (Martonosi was member of 13-person committee that authored the report.)
https://www.nap.edu/catalog/25196/quantum-computing-progress-and-prospects

Magnus Själander, Margaret Martonosi, and Stefanos Kaxiras. Power-Efficient Computer Architectures: Recent Advances. Synthesis Lectures on Computer Architecture 2014 9:3, 1-96

Stefanos Kaxiras and Margaret Martonosi. <u>Computer Architecture Techniques for Power-Efficiency</u>. Morgan & Claypool Publishers Synthesis Lectures on Computer Architecture. 2008,

ARCHIVAL PAPERS

1. HetArch: Heterogeneous Microarchitectures for Superconducting Quantum Systems. S S. Stein, et al. Proceedings of the 56th Annual IEEE/ACM International Symposium on Microarchitecture. 2023

2. Architectural Support for Optimizing Huge Page Selection Within the OS. A Manocha, Z Yan, E Tureci, JL Aragón, D Nellans, M Martonosi. Proceedings of the 56th Annual IEEE/ACM International Symposium on Microarchitecture. 2023

3. AutoCC: Automatic Discovery of Covert Channels in Time-Shared Hardware. M Orenes-Vera, et al. Proceedings of the 56th Annual IEEE/ACM International Symposium on Microarchitecture. 2023

4. DECADES: A 67mm2, 1.46TOPS, 55 Giga Cache-Coherent 64-bit RISC-V Instructions per second, Heterogeneous Manycore SoC with 109 Tiles including including Accelerators, Intelligent Storage, and eFPGA in 12nm FinFET. F Gao, et al. 2023 IEEE Custom Integrated Circuits Conference (CICC).

5. TensorQC: Towards Scalable Quantum Classical Hybrid Compute via Tensor Networks. W Tang, M Martonosi. Bulletin of the American Physical Society   2023

6. Dalorex: A data-local program execution and architecture for memory-bound applications. M Orenes-Vera, E Tureci, D Wentzlaff, M Martonosi. 2023 IEEE International Symposium on High-Performance Computer Architecture

7. The implications of page size management on graph analytics. A Manocha, Z Yan, E Tureci, JL Aragón, D Nellans, M Martonosi. 2022 IEEE International Symposium on Workload Characterization (IISWC).

8. Tiny but Mighty: Designing and realizing scalable latency tolerance for Manycore SOCs. M. Orenes-Vera, et al. ACM/IEEE 49th International Symposium on Computer Architecture. 2022.

9. SupermarQ: A Scalable Quantum Benchmark Suite. T Tomesh, P Gokhale, V Omole, GS Ravi, KN Smith, J Viszlai, XC Wu, F. T. Chong, M. Martonosi. HPCA 2022 **(Best Paper Award).** Also arXiv preprint arXiv:2202.11045

10. AutoSVA: Democratizing Formal Verification of RTL Module Interactions. M Orenes-Vera, A Manocha, D Wentzlaff, M Martonosi. 2021 58th ACM/IEEE Design Automation Conference (DAC), 535-540

11. Navigating the Seismic Shift of Post-Moore Computer Systems Design. A Banerjee, S Basu, E Brunvand, P Mazumder, WR Cleaveland II, G. Singh, M. Martonosi, M. Pembleton. IEEE Micro 41 (06), 162-167

12. Specifying and testing GPU workgroup progress models. T Sorensen, LF Salvador, H Raval, H Evrard, J Wickerson, M Martonosi. Proceedings of the ACM on Programming Languages 5 (OOPSLA), 1-30.

13. Quantum Codesign. T Tomesh, M Martonosi. IEEE Micro 41 (5), 33-40. 2021

14. Designing calibration and expressivity-efficient instruction sets for quantum computing. L Lao, P Murali, M Martonosi, D Browne. 2021 ACM/IEEE 48th Annual International Symposium on Computer Architecture.

15. Noisy Variational Quantum Algorithm Simulation via Knowledge Compilation for Repeated Inference Yipeng Huang, Steven Holtzen, Todd Millstein, Guy Van den Broeck, and Margaret Martonosi ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Detroit, MI, 2021. **Selected as Honorable Mention for IEEE Micro Top Picks in Computer Architecture**

16. CutQC: Using Small Quantum Computers for Large Quantum Circuit Evaluations. W Tang, T Tomesh, J Larson, M Suchara, M Martonosi. International Conference on

Architecture Support for Programming Languages and Operating Systems. 2021. Also available as arXiv preprint arXiv:2012.02333

17. A simulator and compiler framework for agile hardware-software co-design evaluation and exploration. T Sorensen, A Manocha, E Tureci, M Orenes-Vera, JL Aragón, M Martonosi. 2020 IEEE/ACM International Conference on Computer Aided Design (ICCAD).

18. PerpLE: Improving the Speed and Effectiveness of Memory Consistency Testing. Themis Melissaris, Markos Markakis, Kelly Shaw, Margaret Martonosi. The 53rd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2020.

19. Foundations of Empirical Memory Consistency Testing. Tyler Sorensen, Esin Tureci, Jake Kirkham, Margaret Martonosi. SPLASH 2020 OOPSLA Conference.

20. Optimization of Simultaneous Measurement for Variational Quantum Eigensolver Applications. Pranav Gokhale, Olivia Angiuli, Yongshan Ding, Kaiwen Gui, Teague Tomesh, Martin Suchara, Margaret Martonosi, Frederic T. Chong. IEEE Intl. Conference on Quantum Computing and Engineering (QCE). **Best Paper Award.** October 2020.

21. SQUARE: Strategic Quantum Ancilla Reuse for Modular Quantum Programs via Cost-Effective Uncomputation. Yongshan Ding, Xin-Chuan Wu, Adam Holmes, Ash Wiseth, Diana Franklin, Margaret Martonosi, and Frederic T. Chong. Proceedings of the 47th International Symposium on Computer Architecture. 2020. **Selected as Honorable Mention for IEEE Micro Top Picks in Computer Architecture**

22. TransForm: Formally Specifying Transistency Models and Synthesizing Enhanced Litmus Tests. Naorin Hossain, Caroline Trippel, Margaret Martonosi. Proceedings of the 47th International Symposium on Computer Architecture. 2020.

23. Architecting Noisy Intermediate-Scale Trapped Ion Quantum Computers. Prakash Murali, Dripto M. Debroy, Kenneth M. Brown, Margaret Martonosi. Proceedings of the 47th International Symposium on Computer Architecture. 2020.

24. Term Grouping Techniques for VQE and Quantum Dynamics Circuits. K Gui, P Gokhale, T Tomesh, Y Ding, O Angiuli, M Suchara, M Martonosi. Bulletin of the American Physical Society. 2020.

25. MosaicSim: A Lightweight, Modular Simulator for Heterogeneous Systems. Opeoluwa Matthews, Aninda Manocha, Davide Giri, Marcelo Orenes-Vera, Esin Tureci, Tyler Sorensen, Tae Jun Ham, Juan L Aragón, Luca P Carloni, Margaret Martonosi. 2020 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS). **Nominated for Best Paper Award.**

26. Software Mitigation of Crosstalk on Noisy Intermediate-Scale Quantum Computers. P Murali, DC McKay, M Martonosi, A Javadi-Abhari. arXiv preprint arXiv:2001.02826 . International Conference on Architecture Support for Programming Languages and Operating Systems. 2020

27. Minimizing state preparations in variational quantum eigensolver by partitioning into commuting families. P Gokhale, O Angiuli, Y Ding, K Gui, T Tomesh, M Suchara, M Martonosi. arXiv preprint arXiv:1907.13623. 2019

28. Statistical assertions for validating patterns and finding bugs in quantum programs. Y Huang, M Martonosi. Proceedings of the 46th International Symposium on Computer Architecture. 2019

29. OKAPI: In support of application correctness in smart home environments. T Melissaris, K Shaw, M Martonosi. 2019 Fourth International Conference on Fog and Mobile Edge Computing (FMEC) 2019.

30. Resource optimized quantum architectures for surface code implementations of magic-state distillation. A Holmes, Y Ding, A Javadi-Abhari, D Franklin, M Martonosi, FT Chong. Microprocessors and Microsystems 67, 56-70. 2019

31. Full-Stack, Real-System Quantum Computer Studies: Architectural Comparisons and Design Insights. P Murali, NM Linke, M Martonosi, AJ Abhari, NH Nguyen, CH Alderete. Proceedings of the 46th International Symposium on Computer Architecture. (Selected for IEEE Micro Top Picks in Computer Architecture). arXiv preprint arXiv:1905.11349. 2019

32. Efficient Data Supply for Parallel Heterogeneous Architectures. TJ Ham, JL Aragón, M Martonosi, ACM Transactions on Architecture and Code Optimization (TACO) 16 (2), 2019.

33. Security Verification via Automatic Hardware-Aware Exploit Synthesis: The CheckMate Approach. C Trippel, D Lustig, M Martonosi IEEE Micro Top Picks in Computer Architecture. 39 (3), 84-93 2019.

34. Noise-adaptive compiler mappings for noisy intermediate-scale quantum computers. P Murali, JM Baker, A Javadi-Abhari, FT Chong, M Martonosi. Proceedings of the Twenty-Fourth International Conference on Architectural Support for Programming Languages and Operating Systems. 2019

35. Formal constraint-based compilation for noisy intermediate-scale quantum systems. P Murali, A Javadi-Abhari, FT Chong, M Martonosi. Microprocessors and Microsystems 66, 102-112. 2019

36. Next Steps in Quantum Computing: Computer Science's Role. M Martonosi, M Roetteler. arXiv preprint arXiv:1903.10541 2019.

37. Caroline Trippel, Daniel Lustig, and Margaret Martonosi. CheckMate: Automated Synthesis of Hardware Exploits and Security Litmus Tests. The 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2018.

38. Yatin A. Manerkar, Daniel Lustig, Margaret Martonosi, and Aarti Gupta. PipeProof: Automated Memory Consistency Proofs of Microarchitectural Specifications. The 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2018.

39. Yongshan Ding, Adam Holmes, Ali Javadi-Abhari, Diana Franklin, Margaret Martonosi, and Frederic T. Chong. Magic-State Functional Units: Mapping and Scheduling Multi-Level Distillation Circuits for Fault-Tolerant Quantum Architectures. The 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2018.

40. Hongce Zhang, Caroline Trippel, Yatin A. Manerkar, Aarti Gupta, Margaret Martonosi, and Sharad Malik. Integrating Memory Consistency Models with Instruction-Level Abstraction for Heterogeneous System-on-Chip Verification. The 18th Conference on Formal Methods in Computer-Aided Design (FMCAD), October 2018.

41. Yatin A. Manerkar, Daniel Lustig, Margaret Martonosi, and Michael Pellauer. "RTLCheck: Verifying the Memory Consistency of RTL Designs", the 50th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), October 2017.

42. Ali Javadi-Abhari, Pranav Gokhale, Adam Holmes, Diana Franklin, Ken Brown, Margaret Martonosi, and Frederic T. Chong. Optimized Surface Code Communication in Superconducting Quantum Computers, International Symposium on Microarchitecture. Boston, MA. October 2017

43. Themis Melissaris, Kelly A. Shaw, Margaret Martonosi. Locomotive: Optimizing Mobile Web Traffic Using Selective Compression, IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM), June 2017.

44. TriCheck: Memory Model Verification at the Trisection of Software, Hardware, and ISA. Caroline Trippel, Yatin A. Manerkar, Daniel Lustig, Michael Pellauer, Margaret Martonosi. 22nd International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Xian, China, April 2017

45. Graphicionado: A High-Performance and Energy-Efficient Accelerator for Graph Analytics, Tae Jun Ham, Lisa Wu, Narayanan Sundaram, Nadathur Satish, Margaret Martonosi. 49th Annual IEEE/ACM International Symposium on Microarchitecture. October, 2016. **(Best Paper Award)**.

46. COATCheck: Verifying Memory Ordering at the Hardware-OS Interface. Daniel Lustig, Geet Sethi, Margaret Martonosi, and Abhishek Bhattacharjee. 21st International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), April 2016. **(Subsequently selected for IEEE Micro Top Picks in Computer Architecture)**.

47. CCICheck: Using μhb Graphs to Verify the Coherence-Consistency Interface. Yatin A. Manerkar, Daniel J. Lustig, Michael I. Pellauer, Margaret Martonosi. 48th Annual IEEE/ACM International Symposium on Microarchitecture. December, 2015. **(Nominated for Best Paper Award)**.

48. DeSC: Decoupled Supply-Compute Communication Management for Heterogeneous Architectures. Tae Jun Ham, Juan Luis Aragon, Margaret Martonosi. 48th Annual IEEE/ACM International Symposium on Microarchitecture. December, 2015. **(Subsequently selected for Honorable Mention in IEEE Micro Top Picks in Computer Architecture)**.

49. Daniel J. Lustig, Caroline Trippel, Michael Pellauer, Margaret Martonosi. ArMOR: Defending Against Consistency Model Mismatches in Heterogeneous Architectures", the 42nd International Symposium on Computer Architecture (ISCA), June 2015.

50. Ozlem Bilgir Yetim and Margaret Martonosi. Dynamic Adaptive Techniques for Learning Application Delay Tolerance for Mobile Data Offloading. IEEE INFOCOM 2015. March, 2015. (Acceptance rate: 19%)

51. Yavuz Yetim, Sharad Malik, Margaret Martonosi. CommGuard: Mitigating Communication Errors in Error-Prone Parallel Execution. 20th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2015.

52. Jeff Heckey, Ali JavadiAbhari, Shruti Patil, Adam Holmes, Daniel Kudrow, Ken Brown, Diana Franklin, Frederic T. Chong, and Margaret Martonosi. Compiler Management of Communication and Parallelism for Quantum Computation. 20th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2015.

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55. Ozlem Bilgir Yetim and Margaret Martonosi. Adaptive Delay-Tolerant Scheduling for Efficient Cellular and WiFi Usage. IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks. June, 2014.

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57. Wenhao Jia, Kelly A. Shaw, and Margaret Martonosi. MRPB: Memory Request Prioritization for Massively Parallel Processors. 20th IEEE International Symposium on High Performance Computer Architecture (HPCA 2014)

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59. Wenhao Jia, Kelly Shaw, and Margaret Martonosi, "Starchart: Hardware and Software Optimization Using Recursive Partitioning Regression Trees." International Conference on Parallel Architectures and Compilation Techniques (PACT), September, 2013.

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62. Maja Etinski, Margaret Martonosi, Kien Le, Ricardo Bianchini, and Thu Nguyen. "Optimizing the Use of Request Distribution and Stored Energy for Cost Reduction in Multi-Site Internet Services" The Second IFIP Conference on Sustainable Internet and ICT for Sustainability, October, 2012.

63. Ozlem Bilgir Yetim and Margaret Martonosi. "Adaptive Usage of Cellular and WiFi Bandwidth: An Optimal Scheduling Formulation (Short Paper)." The 7th ACM International Workshop on Challenged Networks (CHANTS 2012). August 2012.

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71. Emmanouil Koukoumidis, Li-Shiuan Peh and Margaret Martonosi. SignalGuru: Leveraging Mobile Phones for Collaborative Traffic Signal Schedule Advisory. 9th International Conference on Mobile Systems, Applications, and Services (MobiSys), June 2011. **Best Paper Award.**

72. Sibren Isaacman, Ramon Caceres, Alex Varshavsky, Margaret Martonosi, Richard A. Becker, Stephen Kobourov. Identifying Important Places in People's Lives from Cellular Network Data. Pervasive 2011, the Ninth International Conference on Pervasive Computing. June, 2011.

73. Emmanouil Koukoumidis, Li-Shiuan Peh, and Margaret Martonosi. RegReS: Adaptively Maintaining a Target Density of Regional Services in Opportunistic Vehicular Networks. Ninth Annual IEEE International Conference on Pervasive Computing and Communications (PerCom 2011). March, 2011.

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85. Pei Zhang and Margaret Martonosi. "LOCALE: Collaborative Localization Estimation for Sparse Mobile Sensor Networks". Proc. International Conference on Information Processing in Sensor Networks (IPSN). April 2008.

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87. Christopher M. Sadler and Margaret Martonosi. "DALi: A Communication-Centric Data Abstraction Layer for Energy-Constrained Devices in Mobile Sensor Networks," Proceedings of the ACM Conference on Mobile Systems, Applications, and Services (MobiSys) June 2007.

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92. Pei Zhang, and Margaret Martonosi. "Poster Abstract: Energy Adaptation Techniques to Optimize Data Delivery in Store-and-Forward Sensor Networks". The Fourth ACM Conference on Embedded Networked Sensor Systems. Nov, 2006.

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94. James Donald and Margaret Martonosi. Power Efficiency for Variation-Tolerant Multicore Processors. IEEE International Symposium on Low Power Electronics and Design (ISLPED). Tegernsee, Germany. October, 2006.

95. Yong Wang, Margaret Martonosi, and Li-Shiuan Peh, " Supervised Learning in Sensor Networks: New Approaches with Routing, Reliability Optimizations ", Proceedings of IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON 2006), Reston, VA, Sept., 2006

96. Yong Wang, Margaret Martonosi, and Li-Shiuan Peh, "Situation-aware Caching Strategies in Highly Varying Mobile Networks", Proceedings of IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2006), Monterey, CA, September, 2006

97. James Donald and Margaret Martonosi. Techniques for Multicore Thermal Management: Classification and New Exploration. *33rd International Symposium on Computer Architecture*. Boston, MA. June, 2006.

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International Symposium on High-Performance Computer Architecture (HPCA). February, 2005. San Francisco, CA.

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122. Zhigang Hu, Stefanos Kaxiras, Margaret Martonosi. Timekeeping in the Memory System: An Efficient Approach to Predicting and Optimizing Memory Behavior. *29th International Symposium on Computer Architecture*. Anchorage, Alaska. May, 2002, pages 209-220.

123. Russell Joseph and Margaret Martonosi. Run-time Power Estimation in High Performance Microprocessors. *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED'01)*. August, 2001, pages 135-140.

124. Stefanos Kaxiras, Zhigang Hu, Margaret Martonosi. Cache Decay: Exploiting Generational Behavior to Reduce Cache Leakage Power. *28th International Symposium on Computer Architecture*. Göteborg, Sweden. July, 2001, pages 240-251.

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126. David Brooks and Margaret Martonosi. Dynamic Thermal Management for High-Performance Microprocessors. *Seventh International Conference on High-Performance Computer Architecture (HPCA-7)*. January, 2001. **Awarded HPCA 2021 Test of Time award for long-term impact.**

127. K. Skadron, M. Martonosi, D. W. Clark, A Taxonomy of Branch Mispredictions, and Alloyed Prediction as a Robust Solution to Wrong-History Mispredictions, *Symposium on Parallel Architectures and Compilation Techniques*. October, 2000.

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SUMMARY OF ACTIVITIES

TEACHING

Martonosi has an outstanding track record of innovation in education, both in bringing current research topics into the classroom, and in teaching STEM topics to non-STEM students. Her ELE101 course "Computing for a Mobile World" offered undergraduates an in-depth programming experience (satisfying the Engineering School's computing requirement) while also exposing them to issues from mobile networking, power-efficiency and other related topics. Perhaps in part of its unique approach in teaching "intro programming", her class also was notable for attracting a diverse range of students, with roughly twice the women of other intro programming options and a range of engineering and non-engineering majors. At the "other end" of the curriculum, Martonosi teaches a graduate course entitled "Great Moments in Computing", in which students learn about our discipline's most fundamental topics by reading and discussing *original* primary-source materials from George Boole, Alan Turing, Maurice Wilkes, Gordon Moore, and others.

Operating Systems
- COS318.
- *Comprehensive course on Operating Systems Concepts and Design. Aimed primarily at upper-level undergraduates, with some graduate enrollment also. Semester-long course project implements a full operating system.*
- Fall, 2011.

Computer Architecture
- EE 475.
- *Advanced Computer Architecture class aimed seniors and graduate students. Taught in a discussion-oriented, interactive style with design scenarios and problems posed to students during lecture. In-depth research project serves as capstone experience.*
- Fall, 1994; Spring, 1996; Fall, 1996; Fall, 1997; Fall, 1998; Fall, 1999 (partial); Fall, 2006; Fall, 2007; Fall, 2008; Fall, 2009; Spring, 2011. Spring 2024.

Great Moments in Computing
- Taught first as EE580, now listed as EE583/CS583.
- *Martonosi introduced this course (co-taught with CS Prof. Doug Clark) to expose EE and CS graduate students to the great works of the field. Discussion-based course*

covers theories and inventions from Boole, Wilkes, Turing, Moore, and others using original, primary-source readings.
- Fall, 2003; Fall, 2005; Spring, 2008; Spring, 2009; Spring, 2013; Spring 2015.

Mobile Computing
- Taught first as COS590B.
- *Discussion-based course covers theory, practice, and technology trends in mobile systems. Course project to build or evaluate a mobile phone application or other mobile system.*
- Spring, 2012

Green Information Technology
- Taught first as EE580A.
- *Discussion-based course covers techniques for power-aware computing with a particular focus on datacenters and very-large-scale parallel systems. In addition to computer systems and techniques, the course also covers public policy issues related to electricity pricing and carbon markets.*
- Fall, 2010

Computing for a Mobile World
- ELE 101, Co-taught with Prof. Steve Lyon.
- *Introductory programming course which both satisfied the Engineering School's computing requirement for all Engineering majors, and also satisfied the "Science and Technology" requirement for non-Engineers. Highly-diverse collection of students from wide range of majors.*
- *Introduced students both to programming and more broadly to issues of modern computing including performance and energy constraints, networking, and graphical user interfaces.*
- *Curriculum development and equipment funded via award from Princeton's 250th Anniversary Fund for Innovation in Undergraduate Education.*
- Spring, 2001; Spring, 2002; Spring, 2003; Spring, 2004.

Computer Organization
- Taught first as EE375 then cross-listed as EE375/CS471, then as CS/EE375.
- *First course in Princeton's Computer Organization / Computer Architecture sequence. Introduces students to basics of instruction fetch and execution. In 2000, Martonosi significantly revamped and modernized the hands-on lab, which includes processor design using FGPA emulation. In 2013, Martonosi returned to the course and revamped it to adjust prerequisite requirements to fit CS curriculum.*
- Fall 1999 (partial); Fall, 2000; Fall, 2001; Fall, 2002; Fall, 2013; Fall, 2014; Fall, 2016-2019. Fall 2024.

Configurable Computing
- Taught first as EE580 (special topics) and subsequently as EE470.
- *Senior and Graduate-level course on the use of programmable hardware (e.g. FPGAs) for customized computing of targeted algorithms.*
- *Curriculum development and equipment funded via award from Princeton's 250th Anniversary Fund for Innovation in Undergraduate Education.*
- Spring, 1997; Spring, 1998; Spring, 1999; Spring 2000.

High-Performance Computing: Design and Evaluation
- ELE 580—special topics.
- *Special topics graduate seminar course on methods and tools for Computer Performance Modeling, Simulation, and Measurement.*
- Spring, 1995

ADVISING

PH.D. STUDENTS GRADUATED:

1. Marcelo Orenes Vera, "Navigating Heterogeneity and Scalability in Modern Chip Design", May, 2024.
2. Naorin Hossain, "Navigating Emerging Complexities of Modern Systems: Advancements in Automated Verification and Security Techniques", January, 2024.
3. Aninda Manocha, "Optimizing Data Supply and Memory Management for Graph Applications in Post-Moore Hardware-Software Systems", May 2023
4. Teague Tomesh. "Co-designing Quantum Computer Architectures and Algorithms to Bridge the Quantum Resource Gap". January, 2023.
5. Prakash Murali. "Enabling Practical Quantum Computation: Compiler and Architecture Techniques for Bridging the Algorithms-to-Devices Resource Gap". October, 2021.
6. Themistoklis Melissaris. "Testing and Analyzing Correctness in Concurrent Systems: From Microprocessors to IoT and Distributed Systems". July 2021.
7. Yatin Manerkar. Progressive Automated Formal Verification for Memory Consistency in Parallel Processors. First job: Pre-battical at University of California, Berkeley and tenure-track faculty position at University of Michigan. December, 2020.
8. Caroline Trippel. Concurrency and Security Verification in Heterogeneous Parallel Systems. October, 2019. First job: Pre-battical at Facebook Research, and tenure-track faculty position at Stanford University.
9. Tae Jun Ham. Data Access Optimization in Accelerator-Oriented Heterogeneous Architecture through Decoupling and Memory Hierarchy Specialization. June, 2018. First job: Post-doc at Seoul National University (to satisfy Korean military service.)
10. Ali Javadi-Abhari. Towards a Scalable Software Stack for Resource Estimation and Optimization in General-Purpose Quantum Computers. June, 2017. First Job: IBM T. J. Watson Research Center.
11. Daniel Lustig. Specifying, Verifying, and Translating Between Memory Consistency Models. November, 2015. First job: NVIDIA Research.
12. Yavuz Yetim. Graduated 2015. Streaming Computation on Error-Prone Programmable Platforms. First job: Google.
13. Ozlem Bilgir Yetim. Graduated 2015. Minimizing Cellular Data Usage Using Application Delay Tolerance. First job: VMWare.
14. Wenhao Jia. Graduated 2014. Analysis and Optimization Techniques for Massively Parallel Processors. First job: Qualcomm Research. (Co-advised with Prof. Kelly Shaw, University of Richmond.)
15. Carole-Jean Wu. Graduated 2012. Dynamic Techniques for Mitigating Inter- and Intra-Application Cache Interference. First job: Tenure-track Assistant Professor, Arizona State University.
16. Sibren Isaacman. Graduated 2012. Modeling the Impact of Human Mobility: Mobile Devices as Sensors and Content Vectors. First job: Tenure-track Assistant Professor, Loyola University of Maryland.
17. Emmanouil Koukoumidis. Graduated 2011. Collaborative and Adaptive Mobile Device-Resident Service Architectures. First job: Microsoft Corp.

18. Abhishek Bhattacharjee. Graduated 2010. <u>Thread Criticality and TLB Enhancement Techniques for Chip Multiprocessors</u>. Now tenured Professor, Rutgers University.
19. Dr. Eric Chi. Graduated 2009. <u>Architecting Efficiency, Performance, and Scalability for Quantum Computers</u>. Now at NVIDIA.
20. Dr. Pei Zhang. Graduated 2008. <u>Collaboration and Adaptation for the Longevity of Mobile Delay-Tolerant Sensor Systems.</u> Research Scientist at Carnegie Mellon University.
21. Dr. Gilberto Contreras. Graduated 2008. <u>Support for Dynamic Management of Parallelism in Chip Multiprocessors</u>. Now at NVIDIA.
22. Dr. Yong Wang. Graduated 2007, (CS student, co-advised with Prof. Li-Shiuan Peh.) <u>Situation-Aware Optimizations in Challenged Networks.</u> Now at VMWare.
23. Dr. Canturk Isci. Graduated 2007. <u>Workload-Adaptive Power Management with Live Phase Monitoring and Prediction</u>.
24. Dr. James Donald. Graduated 2007. <u>Techniques for Multicore Power and Thermal Management</u>. Now at NVIDIA.
25. Dr. Chris Sadler. Graduated 2007. <u>Energy Conservation Techniques in Mobile Delay-Tolerant Sensor Networks</u>. Now at Google.
26. Dr. Qiang Wu. Graduated 2006. (CS student, co-advised with Prof. Douglas W. Clark.) Architectural and Compiler Techniques for Microprocessor Power and Performance Management.
27. Dr. Fen Xie. Graduated 2006. (co-advised with Prof. Sharad Malik.) <u>Optimizing and Bounding Software-Controlled Dynamic Voltage/Frequency Scaling: Analysis for Uniprocessors and Multiprocessors.</u> Now at EMC.
28. Dr. Philo Juang. Graduated 2006. <u>Energy Management Techniques for Chip Multiprocessors</u>. Now at Google Corp.
29. Dr. Russell Elphege Joseph. Graduated 2004. <u>Monitoring and Managing Microprocessor Power Variation: Techniques and Applications</u>. Faculty at Northwestern University.
30. Dr. Zhigang Hu. Graduated 9/2002. <u>The Timekeeping Methodology: Exploiting Generational Lifetime Behavior to Improve Processor Power and Performance</u>. Independent investor.
31. Prof. David Brooks. September, 2001. <u>Design and Modeling of Power-Efficient Computer Architectures</u>. Endowed Chair Professor. Harvard University School of Engineering and Applied Sciences.
32. Cheng Liao. June, 2001. (CS student, co-advised with Prof. Douglas W. Clark.) <u>Using Plug-In Techniques for Programmable I/O Devices</u>. (deceased)
33. Dr. Zhen Luo. January, 2001. <u>Accelerating CAD Applications using Configurable Hardware</u>.
34. Dr. Somnath Ghosh (co-advised with Prof. Sharad Malik) September, 1999. <u>Cache Miss Equations: Compiler Analysis Framework for Tuning Memory Behavior</u>. Now at Intel Corp.
35. Prof. Kevin Skadron. April, 1999 (CS student, co-advised with Prof. Douglas W. Clark). <u>Characterizing and Removing Branch Mispredictions</u>. Endowed Chair Professor at University of Virginia Dept. of Computer Science.
36. Dr. Peixin Zhong. March, 1999. Dissertation Title: <u>Using Configurable Computing to Accelerate Boolean Satisfiability</u>. Now at Qualcomm.

CURRENT GRADUATE RESEARCH ADVISEES

Wei Tang

PH.D. DISSERTATION COMMITTEE MEMBER FOR:

Paul Jackson, May 2024

Ishita Chaturvedi (pre-FPO, May 2024)

Fei Gao, First job: TensorTorrent. FPO August, 024.

Jonathan Balkind First job: University of California, Santa Barbara. May 2022.

Bo-Yuan Huang December, 2021

Yongshan Ding. (external examiner) Dept. of Computer Science, University of Chicago. July, 2021

Hongce Zhang. Dept. of Electrical Engineering. June, 2021.

Qi (Jade) Nie (non-reader). Dept. of Electrical Engineering. Mar, 2020.

Michael McKeown (non-reader) Dept. of Electrical Engineering. Dec, 2019.

Jordan Fix (non-reader) Dept. of Computer Science. Nov, 2019

Adi Fuchs (non-reader). Dept. of Electrical Engineering. May, 2019

Yanqi Zhou (non-reader). Dept. of Electrical Engineering. May, 2018.

Arpit Joshi (external examiner), Dept. of Computer Science. University of Edinburgh. April, 2018.

Pareesa Golnari (reader) Dept. of Electrical Engineering. March, 2018.

Yipeng Huang (external committee member), Dept. of Computer Science. Columbia University. February, 2018.

Paolo Mantovani (external committee member), Dept. of Computer Science. Columbia University. May, 2017.

Yaosheng Fu (non-reader). Dept. of Electrical Engineering. September, 2017.

Pramod Subramanyan (reader). Dept. of Electrical Engineering. 12/2016

Vasileios Spiliopoulos, Computer Science, Uppsala University. 9/2016

Konstantinos Koukos, Computer Science, Uppsala University. (Faculty Opponent) 9/2016

Rob Kiefer (non-reader). Dept of Computer Science. 5/2015.

Peng Sun (non-reader). Dept of Computer Science. 5/2015.

Divjyot Sethi (non-reader). Dept. of Electrical Engineering. 9/2014.

Kristof Dubois (external member of Ph.D. Jury) Ghent University, Belgium.

John Demme (External reader), Dept. of Computer Science, Columbia University. 1/2014

Qingyuan Deng (external reader), Dept. of Computer Science, Rutgers University.

Carven Chan (reader) Dept. of Electrical Engineering.

Wyatt Lloyd (non-reader). Dept of Computer Science.

Daniel Schwartz-Narbonne (reader). Dept. of Electrical Engineering.

Prakash Prabhu. (non-reader). Dept. of Computer Science

Arnab Sinha. (non-reader). Dept. of Electrical Engineering. 8/2012.

Kostantinos Aisopos (reader). Department of Electrical Engineering. 4/2012

Niket Agarwal (reader). Dept. of Electrical Engineering. 8/2010.

Kien Le, Rutgers University Dept. of Computer Science

Thomas Jablin (non-reader) Dept. of Computer Science.

Christian Bienia (non-reader) Dept. of Computer Science. 12/2010.

Jeffrey Dwoskin, Dept. of Electrical Engineering. 5/2010.

Bin Li, Dept. of Electrical Engineering. 11/2009.

Changhoon Kim, Dept. of Computer Science. 6/2009.

Kaiyu Chen, Dept. of Electrical Engineering. 1/2009.

Amit Kumar (reader) Dept. of Electrical Engineering. 8/2008

Matthew Bridges, Dept. of Computer Science. 9/2008.

Guilherme Ottoni, Dept. of Computer Science. 8/2008.

Frances Perry, Dept. of Computer Science. 8/2008.

Pedro Chaparro (reader) UPC Barcelona. 2/2008.

Chia-Han Lee, Dept. of Computer Science. FPO 2/2008.

Daijue Tang, Dept. of Electrical Engineering. 7/2007.

-Margaret Martonosi-

Ram Rangan, Dept. of Computer Science. 5/2007 (reader)
Jiang Xu, Dept. of Electrical Engineering. 2/2007.
Taliver Heath (reader) Dept. of Computer Science, Rutgers University. 2/2007.
Vassos Soteriou, Dept. of Electrical Engineering. 12/2006.
Nitin Garg, Dept. of Computer Science. 9/2006.
Ja-Chin Audrey Lee, Dept. of Electrical Engineering. 1/2006.
Yang Ni, Dept. of Computer Science, Rutgers University. 12/2005.
Lin Zhong, Dept. of Electrical Engineering. 9/2005
Kelly Shaw, Dept. of Computer Science, Stanford University. 3/2005.
Magnus Ekman (reader) Chalmers Inst. of Tech., Gothenburg, Sweden 12/2004.
Tat K. Tan, Dept. of Electrical Engineering. 4/2004.
Lintao Zhang (reader) Dept. of Electrical Engineering. 3/2004.
C-H. Hsu (reader) Dept. of Computer Science, Rutgers University. 5/2003.
Jiong Luo, Dept. of Electrical Engineering. 11/2003.
Ying Sophie Zhao (reader) Dept. of Electrical Engineering. 10/2001.

POSTDOCTORAL ASSOCIATES

Esin Tureci. 4/2019-present
Luwa Matthews. Ph.D. Duke. Research on heterogeneous parallelism. 6/2018– 8/2019.
Yipeng Huang. Ph.D. Columbia University. Research on Quantum Computing. 6/2018-present.
Tyler Sorensen. Ph.D. Imperial College, London. Research on heterogeneous parallelism. 7/2018-present.
Daeki Cho. Ph.D. UCLA. Research on heterogeneous mobile systems. 12/2014 – 2015.
Shruti Patil. Ph.D. University of Minnesota, 2012. 3/2013-3/2014. Research on quantum computing and synthesis of QC machines.
Vincent Lenders. Ph.D. ETH Zurich. 2006. 1/2007-1/2008. Research on sparse networks of mobile systems.
Prof. Darko Stefanovic. Ph.D. University of Massachusetts. December, 1998. At Princeton 1/1999 to 8/2000, research on compilation to configurable hardware. Associate Professor, Dept. of Computer Science, University of New Mexico.

UNDERGRADUATE RESEARCH ADVISEES

Fall, 2022: Andra Constantin, Anca Negoiu, Janum Shah, Maithili Shingne, Kevin Wang. (All ’23)
Spring, 2021: Gabriel Contreras ’21.

Fall, 2020: Gabriel Contreras ’21, Nathan Lovett-Genovese ’21, Albert Kim ’21, Eric Tsang ’21, Damon Caron ’21. (IW Seminar on Near-Term Quantum and its Applications)

Spring, 2020: Jake Kirkham ’20, Markos Markakis (EE) ’20. Jason Kim ‘21, Watson Jia ‘21.

Fall, 2019: Jake Kirkham ’20, Markos Markakis (EE) ’20. Jason Kim ‘21, Watson Jia ‘21, Julian Knodt ‘21.

Summer, 2019: Lia Yeh and Emma Dasgupta. Princeton/IBM QURIP program. Yeh’s work won the MICRO-52 ACM Student Research Competition and advanced to the grand finals.

Spring, 2019: Lois Dzebissov ’19; John Suh ’20, Jake Kirkham ’20, Nicholas Liu ’21. Markos Markakis (EE) ’20.

Fall 2018: Lois Dzebissov '19.

Spring, 2018: Vivian Mo '18. Melana Hammel '18. Rani Jaiswal '18 (second reader). Katherine Lim '18 (second reader).

Fall, 2017: Vivian Mo '18. Melana Hammel '18.

Spring 2017: CS Independent Work Co-Coordinator. Troy Murtha '17. Daphne Weinstein '17.

Fall, 2016: Daphne Weinstein. IW Seminar 02 on Internet of Things.

Spring, 2015: Gabriel Banevicius, Salvador Martinez

Fall 2014: Gabriel Banevicius, Matthew Drabick, Matthew Haake, Jonathan Meisel.

Previous semesters:
Class of 2015
        Gabe Banevicius (Junior Thesis, 2 semesters)
        Cornellius Metto
Class of 2014
        Noah Apthorpe
        Ailsa Leen (Oxford exchange program. 2 semesters)
        Catherine Wu
Class of 2013
        Richard Morse Price II (2 semesters, thesis)
        Shreshth Singhal (2 semesters, thesis)
        Kaitlin Stouffer (2 semesters, thesis. Princeton Sachs Prize winner; Gates Cambridge Scholar)
Class of 2012
        Matt Jacobson
        Eric Kuto
        Zane Ma
        Kashif Smith (2 semesters, thesis)
Class of 2011
        Kate Fischl
        Griffin Telljohann (CS, 2 semesters, thesis)
        Tarun Pondicherry (second reader on EE Senior Thesis.)
Class of 2010
    Sahar Hasan (undergraduate at Columbia University, summer intern at Princeton via CRA-W
        Distributed Mentoring Program)
    Muhammad Amjad
    T.J. Fazio (CS, one semester junior independent work, plus two semesters senior thesis).
    Evan Kelly
    Brian Levee
    Michael Bachand
Class of 2009
    Megan Elmore (undergraduate at Georgia Tech, summer intern at Princeton via CRA-W
        Distributed Mentoring Program)
    Brian Geistweite (CS, 2 semesters, thesis)
    Ryan Bayer

Class of 2008
- Adriana Kovashka (undergraduate at Pomona College, summer intern at Princeton via CRA-W Distributed Mentoring Program)
- Rebecca Fischer (undergraduate at Hiram College, summer intern at Princeton via CRA-W Distributed Mentoring Program)

Class of 2007
- Matthew Plough (SRC Undergraduate Research Award)
- Gila Engel (undergraduate at Touro College, summer intern at Princeton via CRA-W Distributed Mentoring Program)
- Maria Kazandjieva (undergraduate at Mt. Holyoke College, summer intern at Princeton via CRA-W Distributed Mentoring Program)

Class of 2006
- Prithvi Raj (2 semesters)

Class of 2004
- Abhinav Agrawal (Intel Research Award winner)
- Rachel Armitage (Oxford University Class of '04; via Princeton-Oxford exchange program; 2 semesters)

Class of 2003
- Brad Hill

Class of 2002
- Finnegan Callabro
- Samuel Edoho-Eket (3 semesters)
- Russ Ellis
- Chidozie Enyinna (2 semesters)
- Lisa Hsu
- Jason Kace
- Kinari Patel (2 semesters)
- Karen Tang (2 semesters)
- Jeremy Wall (2 semesters)

Class of 2001
- Marie Eyoum (undergraduate at Virginia Union University, summer intern at Princeton via CRA-W Distributed Mentoring Program)
- Gilberto Contreras (undergraduate at Univ. of Texas El Paso, summer intern at Princeton)

Class of 2000
- Christina Leung
- Conor Madigan
- Matthew Moskewicz
- Hide Oki (CS)
- Andrew Steiner

Class of 1998
- Joshua Toub
- Jason Williams

Class of 1997
- Alfredo Cabeza
- Andrew Howse
- Luke McDowell
- Arvind Seshan
- Kelly Shaw (undergraduate at Duke University, summer intern at Princeton via CRA-W Distributed Mentoring Program)
- Jon Snitow

Class of 1996

Asmara Afework (undergraduate at Wayne State University, summer intern at Princeton via CRA-W Distributed Mentoring Program)
James Fei
Peter Kovac
David Oppenheimer
C. Eric Schrock
Class of 1995
Andrew Stack

DEPARTMENTAL, ENGINEERING SCHOOL, AND UNIVERSITY-WIDE SERVICE

2024-present	**Chair**, Princeton CS Faculty hiring committee
2024-present	**Princeton Mpala Faculty Council**
2017-2020	**Academic Advisor:** CS Undergraduate Class of '20
2016	**Freshman Advisor:** SEAS Undergraduate Class of '20
2011-2015	**Academic Advisor:** CS Undergraduate Class of '15
2013-2015	**Chair**, **Faculty Search Committee,** Dept. of Computer Science.
2014-2015	**Member, Senior Faculty Search Committee**, Andlinger Center for Energy and the Environment.
2014-2015	**Review committee member.** ACEE/PEI Joint Call for Proposals for Innovative Research, Teaching, and Mentorship in Energy and the Environment.
9/10-2015	**Executive Committee,** Program in Information Technology and Society
4/08-2015	**Executive Committee**, Keller Center for Innovation in Engineering Education
4/08-2015	**Executive Committee,** Princeton Center for Information Technology Policy.
9/11-6/2012	**Faculty Search Committee,** Dept. of Computer Science.
1/11-12/11	**Acting Director,** Princeton Center for Information Technology Policy.
2/11-6/11	**Selection Community**, Princeton McGraw Center for Teaching and Learning Graduate Mentoring Award.
9/10-1/11	**Search committee**, Princeton University Dean of the College.
9/10-5/11	**Faculty Search Committee,** Dept. of Electrical Engineering.
3/07-6/2010	**Academic Advisor:** EE Undergraduate Class of '10
4/06-4/08	**Executive Committee,** Princeton Institute for International and Regional Studies.
5/07	**Faculty Judge.** Princeton Undergraduate Research Symposium.
7/05-7/07	**Associate Dean for Academic Affairs,** School of Engineering and Applied Science
9/05-7/07	**Chair, Faculty Team on Engineering Diversity (FTE-D)**
9/05-6/06	**Co-Chair, Faculty Search committee for Transformative hire in Engineering and the Life Sciences**
9/03-6/04	**Fellowship Sub-Committee of the Faculty Committee on the Graduate School**
3/03-6/04	**SEAS Strategic Planning Committee**
11/02-9/03	**Policy Sub-Committee of the Faculty Committee on the Graduate School**
9/02-6/04	**University Priorities Committee** (Chaired by Provost, makes operating budget recommendations to Trustees)
12/01-4/02	**Selection Committee for President's Award for Distinguished Teaching**
9/01-6/04	**EE Department Director of Graduate Studies**
9/01-6/02	**Freshman Adviser, SEAS Undergraduate Class of '05.**

9/01-6/02	**Student Life and Discipline Subcommittee of the Faculty Committee on the Graduate School**
9/00-9/01	**EE Department Undergraduate Curriculum Committee**
9/00-9/01	**Chair, EE Department Undergraduate Labs Committee**
9/00-6/01	**Faculty Advisory Committee, McGraw Center for Teaching and Learning**
1/99-8/00, 1/01-6/04	**Faculty adviser to Princeton GWISE (Graduate Women in Science and Engineering)**
1/01-9/01	**EE Department Computing Committee**
10/01-6/04	**EE representative to Master of Engineering program committee.**
9/99-9/01	**Computer Engineering group Graduate Coordinator**
1/99-10/00	**EE Department General Exam Committee**
10/98-3/00	**EE Department Strategic Planning Committee**
9/98-6/99	**Freshman Adviser, SEAS Undergraduate Class of '02.**
9/97-5/00	**Council of the Princeton University Community**
9/97-5/00	**Faculty Advisory Committee on Policy**
9/97-5/00	**Executive Committee of the Council of the Princeton University Community**
9/97-6/98	**Freshman Adviser, SEAS Undergraduate Class of '01.**
3/95-6/98	**Undergraduate Academic Advisor: EE Undergraduate Class of '98**
9/94-9/95	**Seminar Chair**. Computer Engineering Group, Dept. of Electrical Engineering
3/96-99	**Princeton Summer Institute Organizing Committee**
6/95-present	**Faculty Fellow**. Affiliated professor at Princeton University's residential colleges.

RESEARCH COMMUNITY LEADERSHIP AND SERVICE

<u>Series Editor</u>**, Morgan-Claypool Synthesis Lectures in Computer Architecture.**

<u>Program Committee Chair:</u>
- **Technical Program Committee Co-Chair, ACM Symposium on Computing for Development (DEV-4). December, 2013.**
- **Technical Program Committee Chair, 2013 International Symposium on Computer Architecture. June, 2013.**
- **Technical Program Co-Chair, 2009 International Conference on High Performance Embedded Architectures & Compilers (HiPEAC).**
- **Technical Program Co-Chair, 6th ACM Conference on Embedded Networked Sensor Systems (SenSys 2008).**
- **Technical Program Chair, 2006 ACM Conference on Architecture Support for Programming Languages and Operating Systems.**
- **Technical Program Committee Co-Chair, 2002 ACM Sigmetrics Conference on Measurement and Modeling of Computer Systems. (Co-chair with Prof. Edmundo de Souza y Silva, UFRJ, Brazil.)**

<u>Conference General Chair:</u>
- **General Co-Chair, 2011 International Conference on High Performance Embedded Architectures & Compilers (HiPEAC).**
- **General Co-Chair, 2009 International Symposium on Microarchitecture (ACM)**

- **Workshop Organizer:** Along with Prof. Kevin Skadron (U. Virginia) organized an invitation-only NSF Workshop on Computer Performance Evaluation with ~20 distinguished attendees. (2001)

Advisory Boards, Boards of Directors, and External Review:
- **Co-Chair, Science Advisory Board for Elevate Quantum.**
  - Elevate Quantum is a multi-state regional organization with the mission to secure the Mountain West's position as the global epicenter for Quantum development. https://www.elevatequantum.org/ (2024-present)
- **Board of Directors, National Center for Women and Information Technology (NCWIT)** (2024-present)
- **DARPA Information Science & Technology (ISAT) Study Group Steering Committee.** The ISAT Study Group was established by DARPA in 1987 to support its technology offices and provide continuing and independent assessment of the state of advanced Information Science technology as it relates to the U.S. Department of Defense. (2024-present)
- **2024: Center for Strategic and International Studies (CSIS) Commission on U.S. Quantum Leadership.**
- **2024-present: SPHERE Advisory Board.** Provide advisory input for large-scale cyberinfrastructure funded by NSF Mid-Scale Research Infrastructure program.
- **2018: Committee of external scholars to review Brown University's Department of Computer Science**
- **2018-2020: Singapore National Research Foundation (NRF) Fellowship Evaluation Panel (FEP)**
- **2017-2018: National Academies of Science, Engineering & Medicine Committee on Technical Assessment of the Feasibility and Implications of Quantum Computing.**
- **2015-2019: NSF Computer and Information Science and Engineering (CISE) Directorate Advisory Committee. Co-Chair 2016-2019.**
- **2014-2017: ACM SIGARCH Maurice Wilkes Award Committee**
- **2012-2015: Member, Advisory Board for the Department of Computer and Information Science at University of Pennsylvania.**
- **External Advisory Committee Member. Computer Engineering Program. University of California, Santa Barbara. 1/2010-2014. Chair of committee: 2012-2014.**
- **Elected Member of CRA Board of Directors, Computing Research Association. 6/09-2018. 2010-11: Chair, Election Committee. Executive committee 2011-2014.**
- **2014-2016. Selection committee member for ABIE Tech Leadership Award, Anita Borg Institute.**
- **2013-4. Expert Evaluator for Recruitment at KTH Royal Institute of Technology, Stockholm, Sweden.**
- **2013-2015: Defense Advanced Research Projects Agency (DARPA) Information Science and Technology (ISAT) study group.**
- **Member of Board of Directors, ACM SIGARCH (ACM's Special Interest Group on Computer Architecture). 7/07-2010.**
- **External Advisory Committee member. NSF ADVANCE Program at Columbia University Earth Institute. 1/2007-2009.**
- **2012-2015: ACM Doctoral Dissertation Award Committee**
- **Swedish Research Council 2010 Senior Researcher Review Committee.**

- **New York Academy of Sciences Blavatnik Award Review Committee.** 2010 selection process.
- **IEEE Fellows Committee.** Class of 2011 Fellows. Class of 2012 Fellows.
- **Member, Anita Borg Institute Award Committee.** 2009-2010.
- **Member, Eckert-Mauchly Award Committee. ACM Representative to joint IEEE/ACM committee selecting most prestigious career award in Computer Architecture.** 2/2007-2010.
- **Member of Interview Committee. Vietnam Education Foundation.** September, 2006; August, 2010. VEF is a US Government agency offering graduate science and engineering fellowships to Vietnamese undergraduates. I was part of an interview trip coordinated by NAE/NAS and VEF that traveled to Hanoi and Ho Chi Minh City to conduct selection interviews.
- **Member of Board of Directors, ACM SIGMETRICS (ACM's Special Interest Group on Performance Measurement and Modeling). 7/01-7/05.**
- **Vice-Chair, ACM SIGARCH (ACM's Special Interest Group on Computer Architecture). 7/03-7/07 (two terms).**
- **Scientific Committee Member, African Institute of Science and Technology.** International, multi-disciplinary committee of academic researchers offering technical and curricular guidance regarding the formation of the three-campus African Institute of Science and Technology (AIST) system.
- **Advisory Board Member, Georgia Institute of Technology: Center for Experimental Research in Computer Systems (CERCS) /Research Infrastructure (RI) Technical Advisory Board. Fall, 2002.** (CERCS is a joint research center spanning College of Computing and School of Electrical and Computer Engineering at Georgia Tech.)

Technical Service towards Improving Diversity:
- **Chair. CRA-W/CDC Summer School Workshop on Computer Architecture. Princeton, NJ July 2006.**
- **CRA-WP, Computing Research Association's Committee on the Status of Women in Computing Research. Member of Board: April, 2005-2013. Elected Member of Steering Committee: April, 2011-2013. Co-Chair: 2017-2020**

Member of Conference Steering Committee:
- 2011 CRA/CCC Workshop on "Advancing Computer Architecture Research: What Now in ILP Research?". September, 2010.
- 1st ACM Annual Symposium on Computing for Development (DEV). December, 2010
- 8th ACM Conference on Embedded Networked Sensor Systems (SenSys 2010). November, 2010.
- 2010 CRA/CCC Workshop on "Advancing Computer Architecture Research: Popular Parallel Programming". February, 2010.
- 2010 International Conference on High Performance Embedded Architectures & Compilers (HiPEAC) January, 2010.
- 7th ACM Conference on Embedded Networked Sensor Systems (SenSys 2009). November, 2009
- 2009 CRA/CCC Workshop on "Computer Science and Global Development". August, 2009.
- 14th Annual International Conference on Architecture Support for Programming Languages and Operating Systems. March, 2009.

- 13th Annual International Conference on Architecture Support for Programming Languages and Operating Systems. March, 2008.
- 32nd International Symposium on Computer Architecture (ISCA). June, 2005.
- 2005 International Conference on High Performance Embedded Architectures & Compilers (HiPEAC) January, 2005.

Editorial Boards:

IEEE Micro (7-2009-2016)
ACM Transactions on Architecture and Compiler Optimization (5/2003 to 5/2015)
IEEE Transactions on Mobile Computing (2/2008-8/2012)
IEEE Computer Architecture Letters (12/2001 to 2005)
ACM Transactions on Modeling and Computer Simulation (1/1999 to 2004)
IEEE Transactions on Parallel and Distributed Systems (1/2000 to 1/2004)

Technical Program Committee Memberships:

2020
- International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2020.

2019
- International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2019. (External Review Committee.)
- 51st Annual IEEE/ACM International Symposium on Microarchitecture. (MICRO-51). October, 2019. (External Review Committee)
- IEEE MICRO Top Picks in Computer Architecture.

2018
- IEEE International Conference on Rebooting Computing

2017
- 50th Annual International Symposium on Microarchitecture (MICRO-50)

2016
- No program committees due to sabbatical leave.

2015
- 47th International Symposium on Computer Architecture (ISCA). June, 2015
- MobiSys 2015: The 13th International Conference on Mobile Systems, Applications, and Services. June, 2015.
- International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2015. (External Review Committee.)
- IEEE International Symposium on High-Performance Computer Architecture (HPCA). February, 2015.

2014
- Program Committee for pre-ISCA Workshop on Parallelism in Mobile Platforms (PRISM-2). June, 2014.
- Selection committee for IEEE MICRO Special Issue "Top Picks in Computer Architecture" 2014.
- 19th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2014.

- 1st Workshop on Probabilistic and Approximate Computing (Approx14) (Co-located with PLDI). June, 2014

2013
- DEV-4. ACM Conference on Technology for Development. December, 2013. (Program Co-Chair)
- 40th International Symposium on Computer Architecture (ISCA). June, 2013. (Program Chair)

2012
- 17th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS). March, 2012.
- 33rd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2012)
- 39th International Symposium on Computer Architecture (ISCA). June, 2012

2011
- 4th HotPower Workshop. (Associated with SOSP)
- 5th ACM Workshop on Networked Systems for Developing Regions (NSDR 2011)
- WWW2011. Special Track on Emerging Regions. India, 2011.
- 38th International Symposium on Computer Architecture (ISCA). June, 2011
- 16th Annual International Conference on Architecture Support for Programming Languages and Operating Systems (ASPLOS). March, 2011.

2010
- IEEE International Symposium on High-Performance Computer Architecture (HPCA). Bangalore, India. January, 2010.
- 37th International Symposium on Computer Architecture (ISCA). June, 2010
- Eighth International Conference on Mobile Systems, Applications, and Services (Mobisys 2010).
- Workshop on Exascale Evaluation and Research Techniques (EXERT) at ASPLOS. March, 2010
- 1st ACM Annual Symposium on Computing for Development (DEV). December, 2010

2009
- 14th Annual International Conference on Architecture Support for Programming Languages and Operating Systems. March, 2009.
- 2nd Annual HotMetrics workshop, in conjunction with the joint ACM SIGMETRICS/Performance 2009 conference. Seattle, WA. June, 2009.
- Workshop on Energy Efficient Design (WEED 2009) in conjunction with ISCA '09.
- Workshop on Modeling, Benchmarking, and Simulation (MoBS) in conjunction with ISCA '09.

2008
- 35th International Symposium on Computer Architecture (ISCA). June, 2008

2007
- Program Committee IEEE MICRO Special Issue "Top Picks in Computer Architecture" 2007
- 34th International Symposium on Computer Architecture (ISCA). June, 2007
- ACM SIGMETRICS 2007 International Conference on Measurement and Modeling of Computer Systems.

- IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS 2007)
- 16th International World Wide Web Conference (WWW2007). Developing Regions track.
- International Conference on Parallel Architectures and Compilation Techniques (PACT'07)
- MobiSys, the International Conference on Mobile Systems, Applications, and Services, 2007
- Fourth Workshop on Embedded Networked Sensors (EmNets 2007)
- 5th ACM Conference on Embedded Networked Sensor Systems (SenSys), November 2007
- First International Workshop on Mobile Opportunistic Networking (MobiOpp) 2007

2005
- International Solid-State Circuits Conference (ISSCC). TPC member for Digital sub-track.
- Third International Conference on Mobile Systems, Applications, and Services (Mobisys 2005).
- IEEE Fourth International Conference on Information Processing in Sensor Networks (IPSN'05)
- 3rd Annual ACM SIGPLAN Workshop on Memory Systems Performance (MSP '05)
- IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS)
- International Conference on Parallel Architectures and Compilation Techniques (PACT'05)

2004
- IEEE MICRO Special Issue "Top Picks in Computer Architecture" 2004
- 31st International Symposium on Computer Architecture (ISCA). June, 2004
- Eleventh International Symposium on Architectural Support for Programming Languages and Operating Systems (ASPLOS)
- 37th Annual International Symposium on Microarchitecture (Micro-37)

2003
- 2003 International Conference on Supercomputing (ICS)
- First ACM Conference on Embedded Networked Sensor Systems (SenSys 2003)
- 2003 ACM/IEEE International Symposium on Low-Power Electronics and Design (ISLPED'03)
- Workshop on Complexity-Effective Design (WCED '03)

2002
- 35th Annual International Symposium on Microarchitecture (Micro-35)
- Workshop on Complexity-Effective Design (WCED '02)
- International Symposium on Low-Power Electronics and Design (ISLPED '02)
- International Conference on Parallel Architectures and Compilation Techniques (PACT'02)
- 29th International Symposium on Computer Architecture (ISCA). Anchorage, Alaska. May, 2002.
- 8th IEEE International Symposium on High-Performance Computer Architecture (HPCA). Boston, MA. February, 2002.

2001
- IEEE Intl. Symposium on Performance Analysis for Systems and Software (ISPASS).
- ACM Sigmetrics Conference on Measurement and Modeling of Computer Systems
- 2001 ACM/IEEE International Symposium on Low-Power Electronics and Design (ISLPED '01)
- International Conference on Parallel Architectures and Compilation Techniques (PACT'01)

2000
- Workshop on Complexity-Effective Design

- 6th IEEE International Symposium on High-Performance Computer Architecture (HPCA)
- 7th Reconfigurable Architectures Workshop (RAW '00)
- 27th International Symposium on Computer Architecture (ISCA)
- ACM Sigmetrics Conference on Measurement and Modeling of Computer Systems
- 2000 IEEE Symposium on FPGAs for Custom Computing Machines

1999
- 1999 International Conference on Supercomputing (ICS)
- 6th Reconfigurable Architectures Workshop (RAW '99)

1998
- 25th International Symposium on Computer Architecture (ISCA)
- Joint ACM Sigmetrics and Performance '98 Conference on Measurement and Modeling of Computer Systems
- 1998 International Conference on Parallel Processing (ICPP)
- 1998 ACM Sigmetrics Symposium on Parallel and Distributed Tools (SPDT)

1997
- ACM SIGMETRICS Conference on Measurement and Modeling of Computer Systems

Paper and Grant Reviews: for NSF, numerous journals and conferences.

Publicity Chair, 28th International Symposium on Computer Architecture (ISCA). Gothenburg, Sweden. June, 2001.

Committee Member ETS GRE Subject Exam Committee for Computer Science. 2004-2008.

TUTORIALS, SEMINARS, AND KEYNOTE TALKS

2025: Keynote Lecture at 20th anniversary of HIPEAC
2024: Plenary Keynote at IEEE Quantum Week.

Tutorial: International Symposium on Computer Architecture. Tutorial on Simulation Platforms for Heterogeneous Computer Architectures. June, 2018. (With Tureci, Orenes Vera, and Novak)

2020-2023: Numerous NSF Keynotes and Invited lectures, not enumerated.
2020 Keynote Lectures on "The Computing and Information Science Landscape: A Look Forward": International Symposium on Computer Architecture (ISCA) June, 2020, IEEE International Symposium on Workload Characterization (IISWC) October, 2020.

Distinguished Lecturer, University of California, San Diego. November 2019.

Distinguished Lecturer, Rutgers University Dept. of Computer Science. February 2019.

Invited Plenary Speaker. SC'18, Dallas, TX. November, 2018.

Tutorial: MICRO-51. Tutorial on Quantum Computing. October, 2018. (With Chong and Javadi-Abhari)

Invited Participant, White House Summit on Quantum Information Science. September, 2018.

Invited Speaker, IBM Research. September, 2018.

Invited Speaker. Microsoft Faculty Summit. 2 talks in sessions on Security and Quantum Computing. August, 2018.

Keynote Speaker, ACM PLDI Conference. June, 2018.

Keynote Speaker. ACM SIGMETRICS Conference. June, 2018.

Tutorial: International Symposium on Computer Architecture. Tutorial on Quantum Computing. June, 2018. (With Chong and Javadi-Abhari)

Distinguished Lecturer. Duke University Departments of Computer Science and Electrical Engineering. April, 2018.

Keynote Speaker. International Symposium on High-Performance Computer Architecture (HPCA). February, 2018.

Mary Jean Harrold Distinguished Lecturer. Georgia Tech. January 2018.

Keynote Speaker: "End of Moore's Law Challenges and Opportunities: A Computer Architect's Perspectives". IEEE International Conference on Rebooting Computing (ICRC), November, 2017. Washington, DC.

Keynote Speaker: "End of Moore's Law Challenges and Opportunities: A Computer Architect's Perspectives". Future Forum. October, 2017. Beijing, China.

Cornell University A. D. White Visiting Professorship Lecture: "Technology, Policy, and Service: The Way Forward". October, 2017, Ithaca, NY.

Tutorial: International Symposium on Computer Architecture. Tutorial on Specification and Verification of Memory Consistency Models. June, 2017

Invited Panelist: ACM A.M. Turing Award Turns 50: Celebrating 50 Years of Computing's Greatest Achievements (Turing 50). "Moore's Law is Really Dead: What's Next?". Panel chaired by Dr. John Hennessy. June, 2017

Distinguished Lecturer: University of California, Santa Barbara Institute for Energy Efficiency. May 2017.

Distinguished Lecturer: University of Pennsylvania. January 2017

Distinguished Lecturer: Carnegie Mellon University. January 2017

Distinguished Lecture: University of Chicago. December, 2016.

Keynote Speaker: MICRO-49. 49th Annual ACM/IEEE International Symposium on Microarchitecture. (First female keynote speaker in history of conference.) October, 2016.

Invited Seminar: University of Richmond Computer Science. March, 2016.

Invited Seminar: D. E. Shaw Research. February, 2016.

Distinguished Lecturer: Columbia University. November 2015.

Distinguished Lecturer: University of Maryland. October 2015.

Distinguished Lecturer. University of Waterloo School of Computer Science. June, 2015.

Invited Plenary Speaker. Quantum Programming Workshop. Institute for Quantum Computing. University of Waterloo, Ontario. June, 2015.

Distinguished Lecturer: Northeastern University. January 2015.

Invited Speaker. Career Workshop for Women and Minorities in Computer Architecture held in conjunction with MICRO 2014. Cambridge, UK. December, 2014.

Invited Speaker, Ghent University, May 2014.

Invited Speaker. University of Wisconsin. March, 2014.

Distinguished Lecture, Drexel University. January, 2014.

Keynote Speaker: 9th International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC). Vienna, Austria. January, 2014.

Invited Speaker. "Power-Aware Computing: Then and Now" Grace Hopper Celebration of Women in Computing. October, 2013.

Distinguished Lecture, "Mobile Computing: A Computer Architect's View". Duke University Dept. of Computer Science. March 2013.

Keynote Speaker, "Roadmapping Computer Architecture". CRA-W/CDC Computer Architecture Summer School. Evanston, IL. August, 2012.

Invited Speaker, "Mobile Computing: A Computer Architect's View". Microsoft Research, April, 2012.

Keynote Speaker "Parallelism, Heterogeneity, Communication: Emerging Challenges for Performance Analysis". 2012 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS). April, 2012.

Distinguished Lecture, "Mobile Computing: A Computer Architect's View". Cornell University, School of Electrical and Computer Engineering, March, 2012.

Invited Speaker. "Research Challenges for Power-Aware Micro-architecture, Systems and Beyond". NSF Workshop on Cross-Layer Power Optimization and Management. February, 2012.

Distinguished Lecture, "Human Mobility and Universal Data Connectivity: Opportunities and Challenges". University of Illinois, Urbana-Champaign, Dept. of Computer Science. Nov, 2011.

Invited Technical Speaker. "Connecting the Disconnected: Improving Internet Access for the Other Four Billion". Grace Hopper Symposium. Portland, OR. November, 2011.

Workshop. Making the Most of Undergraduate Research. SIGCSE 2011. Dallas, TX. March, 2011.

Invited Seminar. Energy-Efficient Computing: The Role of Parallelism. Intel Corp. May, 2010.

Distinguished Lecture. Energy-Efficient Computing: The Role of Parallelism. University of Toronto. April, 2010.

Cray Distinguished Lecturer. Energy-Efficient Computing: The Role of Parallelism. University of Minnesota Dept. of Computer Science. March, 2010.

Distinguished Lecturer. Energy-Efficient Computing: From the Handheld to the Data Center . University of Southern California Ming Hsieh EE Department Distinguished Lecture Series. February, 2010.

Invited Panelist: CRA Career Mentoring Workshop, February, 2010.

Invited Panelist: DIMACS Workshop on Designing Networks for Manageability. Panel on Management and Energy-Efficiency Issues in Data Centers. November 12 - 13, 2009

Organizer of Special Session International Conference on Compilers, Architectures and Synthesis for Embedded Systems (CASES). Embedded Sensing Systems and Societal Impact. October, 2009.

Invited Panelist: Workshop on Energy-Efficient Design. Associated with International Symposium on Computer Architecture (ISCA). June, 2009.

Invited Lecturer and Panelist. Rutgers CCC Workshop on Green Information Technology. May, 2009.

Distinguished Lecturer. Georgia Institute of Technology Dept. of Electrical and Computer Engineering. Emerging Issues for Next-Generation Microprocessors. Dec. 2008.

Keynote Speaker: International Conference on Compilers, Architectures and Synthesis for Embedded Systems (CASES). ZebraNet and Beyond: Applications and Systems Support for Mobile, Dynamic Networks. October, 2008.

Seminar Speaker. University of Edinburgh Dept. of Computer Science. Emerging Issues for Next-Generation Microprocessors. Sept. 2008.

Invited Speaker. UK Royal Society Meeting on Ubiquitous Computing. ZebraNet and Beyond: Applications and Systems Support for Mobile, Dynamic Networks. March, 2008.

Distinguished Lecturer: ZebraNet and Beyond: Applications and Systems Support for Mobile, Dynamic Networks. Rutgers University Dept. of Electrical and Computer Engineering. March, 2008

Invited Speaker. IBM Research Seminar Series. Emerging Issues for Next-Generation Microprocessors. Feb, 2008.

Invited Speaker. University of Delaware Computer Science Seminar. ZebraNet and Beyond: Applications and Systems Support for Mobile, Dynamic Networks. Feb, 2008.

Invited Speaker. Harvey Mudd College Presentation Days. ZebraNet: Challenges and Experiences in Interdisciplinary Research. April, 2007.

Plenary Speaker: Senior Women's Forum, The Future of Computing: A Vision. Architecting Mobile Systems of the Future: Technical and Social Challenges. Cambridge University, UK. March, 2007.

Invited Speaker. Cornell University AMD Lecture Series in Computer Architecture. Dynamic Adaptive Techniques for Power, Performance, and Thermal Management in Chip Multiprocessors. November, 2006.

Keynote Speaker: Mobile Sensor Networks & the Princeton ZebraNet Project: Experiences and Challenges. Eighteenth Annual Symposium on Computer Architecture and High-Performance Computing (SBAC-PAD). Minas Gerais, Brazil. October, 2006.

Invited Panelist: Research in Interdisciplinary Science. Feedback and Dynamics in Nature Workshop, Grace Hopper Celebration of Women in Computing, San Diego, CA, October, 2006.

Invited Speaker and Interviewer: NAS/NAE trip to Vietnam to interview for US government funded Vietnam Education Foundation (VEF) graduate fellowships. Seminars at two Vietnamese universities.

Invited Teacher: Power-efficient Computing. ACACES 2006 Second International Summer School on Advanced Computer Architecture and Compilation for Embedded Systems. L'Aquila, Italy. July, 2006

Keynote Speaker: Mobile Sensor Networks & the Princeton ZebraNet Project: Experiences and Challenges. Twelfth International IEEE Conference on Parallel and Distributed Systems. Minneapolis, Minnesota. July, 2006.

Invited Panelist: How will we develop and program emerging robust, low-power, adaptive multicore computing systems? Twelfth International IEEE Conference on Parallel and Distributed Systems. Minneapolis, Minnesota. July, 2006.

Keynote Speaker: Embedded Systems in the Wild: ZebraNet Software, Hardware, and Deployment Experiences. ACM SIGPLAN/SIGBED Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES). Ottawa, Canada. June, 2006.

Invited Seminar: Embedded Sensor Networks and the Princeton ZebraNet Project: Experiences and Challenges. Dartmouth College Computer Science Colloquium. February, 2006

Invited Seminar: Embedded Sensor Networks and the Princeton ZebraNet Project: Experiences and Challenges. Harvard University Computer Science Colloquium. November, 2005

Invited Seminar: The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking. University of California, Santa Barbara Department of Computer Science. May, 2005

Invited Seminar: "Adaptive Power/Performance Management for High-end Microprocessors". IBM Research CMOS Design Forum. Yorktown, NY. April, 2005.

Invited Speaker and Participant. Dagstuhl Workshop on Power-aware Computing Systems. Dagstuhl, Germany. April, 2005.

Invited Speaker: "Adaptive Power/Performance Management for High-end Microprocessors". IBM Austin Conference on Energy-Efficient Design. March, 2005.

Distinguished Lecturer. "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking", University of Pennsylvania Department of Computer and Information Science. November, 2004.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". IBM Research. Hawthorne, NY. September, 2004.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". IBM Research. Yorktown, NY. July, 2004.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". Telcordia Labs. Morristown, NJ. December, 2003.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". Microsoft Research Labs. Mountain View, CA. December, 2003.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". University of Washington Computer Science and Engineering Department. October, 2003.

Invited Seminar: "The Princeton ZebraNet Project: Sensor Networks for Wildlife Tracking". Microsoft Research Labs. Seattle, WA. October, 2003.

Invited participant in CRA-W Career Mentoring Workshop panel. (part of Federated Computing Research Conferences). San Diego, CA. June, 2003.

Invited Seminar: "Power-Aware Computer Systems". Purdue University. Computing Research Institute. West Lafayette, IN. May, 2003.

Invited Seminar: "The Princeton ZebraNet Project". Duke University. Fitzpatrick Center on Photonics and Communication Systems. Durham, NC. March, 2003.

Invited Seminar: "Power-Aware Computer Systems". Massachusetts Institute of Technology. EECS Department. Cambridge, MA. December, 2002.

Distinguished Lecturer: "High-Tech Wildlife: Power-Aware Computing, Biocomplexity and the Princeton ZebraNet Project" University of California, San Diego. Sponsored by CRA-W, Depts. of Computer Science, Electrical & Computer Engineering, and CAL-IT^2. November, 2002.

Invited participant in CRA-W faculty/industry/grad student panel on Women, Engineering, and Graduate School. University of California, San Diego Dept of Computer Science. November, 2002.

Invited Seminar: "The Princeton ZebraNet Project: Energy-Efficient Computing meets Biocomplexity Research". Carnegie Mellon University ECE Department. Pittsburgh, PA. October, 2002.

Invited Seminar: "Stratified Sensing Networks". Telcordia Research. Morristown, NJ. October, 2002.

Invited Seminar: "Power-Aware Computer Systems: Measurement, Monitoring and Design". Intel Microprocessor Research Lab. Low-Power Computing Research Forum. Santa Clara, CA. September, 2002.

Invited Seminar: "Energy-Efficient Computing for Wildlife Tracking: Design Tradeoffs for ZebraNet". Rutgers University CS Department. Piscataway, NJ. September, 2002.

Invited Seminar: "Power-Aware Computer Systems: Measurement, Monitoring and Design". HP/Intel Joint Seminar Series. Shrewsbury, MA (Intel/HP IA64 and Alpha Microprocessor groups) and Marlborough, MA (High-performance Alpha Systems division) July, 2002.

Invited Panelist: IEEE Symposium on VLSI panel on Power-Aware Software. Pittsburgh, PA. April, 2002

Host and Panel Member: CRA-W faculty/industry/grad student panel on Women, Engineering, and Graduate School. Princeton University Departments of Electrical Engineering and Computer Science. November, 2001.

Invited Seminar: "Power-Efficient Architectures: Challenges and Opportunities". IBM TJ Watson Research Labs. October, 2001.

Tutorial: "Power-Aware Design, Analysis, and Modeling". 28th Annual International Symposium on Computer Architecture. July, 2001.

Tutorial: "Power-Performance Modeling, Analysis and Validation". 2001 ACM SIGMETRICS Conference on Measurement and Modeling of Computer Systems. Cambridge, MA. June, 2001. (Other tutorial speakers: Dr. Pradip Bose, IBM Research, and my graduate student, David Brooks).

Invited Seminar: "Power-Aware Architectures: Modeling and Techniques". University of Texas-Austin Computer Science Seminar Series. March, 2001.

Invited Tutorial: "Power-Performance Modeling, Analysis and Validation". Seventh IEEE Symposium on High-Performance Computer Architecture (HPCA-7) Monterrey, Mexico. January, 2001. (Other tutorial speakers: Dr. Pradip Bose, IBM Research, and my graduate student, David Brooks).

Distinguished CRA-W Lecturer: "Power-Aware Computer Architecture" University of Massachusetts Dept. of Computer Science. November, 2000.

Invited participant in CRA-W faculty/industry/grad student panel on Women, Engineering, and Graduate School. University of Massachusetts Dept of Computer Science. November, 2000.

Invited Seminar: "Architecture-level Models and Optimizations for Power Dissipation in Superscalar Processors". IBM TJ Watson Research Labs. June, 2000.

Invited Seminar: "Power-Aware Computer Architecture". University of Toronto Department of Electrical Engineering. February, 2000.

Invited Seminar: "Power-Aware Computer Architecture". University of Rochester Departments of Electrical and Computer Engineering and Computer Science. February, 2000.

Distinguished Lecturer: Hardware and Software Techniques for Program Customization. University of Virginia Dept. of Computer Science "Top Gun" Distinguished Lecture Series. November, 1999.

NSF Funding Planning Workshop: Research Directions for Next-Generation Systems Design and Integration. Invited participant. (CISE Directorate, CSA Program). June, 1999.

NSF Funding Planning Workshop: Research Directions for Experimental Systems. Invited participant. (CISE Directorate, Experimental Systems Program). September, 1998.

DARPA Funding Planning Workshop: Power-Aware Computers and Communication. Invited participant. (DARPA Information Technology Office). August, 1998.

Invited Seminars: "Compile-Time and Run-Time Approaches for Customizing Computations and Computer Systems". Given at: University of Washington, Massachusetts Institute of Technology, Stanford University, Microsoft Corporation, Hewlett-Packard Labs, Cornell University, Carnegie Mellon University, Dartmouth University. May, 1998-March, 1999.

Tutorial: 1997 ACM SIGMETRICS Conference on Measurement and Modeling of Computer Systems. Hardware and Software Performance Monitoring. Seattle, WA. June, 1997.

Invited Seminars: "Applications and Tools for Configurable Computing". Given at EE Department Corporate Affiliates Program, NEC C&C Research Laboratories. April-May, 1997.

Invited Talks: "Hardware and Software Performance Monitoring in Parallel and Distributed Systems". Given at AT&T Laboratories, invited talk at IEEE SPDP Workshop on Program Visualization and Instrumentation. February-March, 1997.

Invited Talks: "Memory Performance Monitoring in Modern Sequential and Parallel Computers". Given at: University of Utah, Hewlett-Packard Labs, University of Rochester, invited talk at 1995 International Workshop on Computer Performance Measurement and Analysis, and Silicon Graphics Inc. January 1995-June 1996.

Tutorial: 1996 ACM SIGMETRICS Conference on Measurement and Modeling of Computer Systems. Hardware and Software Performance Monitoring. Philadelphia, PA. May, 1996.