



Bruce R. Childers

Updated June 3, 2018

Education

- 2000 **Ph.D., Computer Science**, *University of Virginia*, Charlottesville, Virginia.
Thesis title: *Custom Embedded Counterflow Pipelines*.
- 1991 **B.S., Computer Science**, *College of William and Mary*, Williamsburg, Virginia.
Thesis title: *Source Code Compaction*. Graduated cum laude.

Positions Held

- 2017–present **Associate Dean**, *Strategic Initiatives, SCI, University of Pittsburgh*.
- 2018–present **Chair**, *Information Culture and Data Stewardship, SCI, University of Pittsburgh*.
- 2012–present **Professor**, *Computer Science, SCI, University of Pittsburgh*.
- 2015–2017 **Co-Director**, *Computer Engineering Program (Graduate), University of Pittsburgh*.
- 2009–2013 **Director of Graduate Studies**, *Computer Science Department, University of Pittsburgh*.
- 2006–2012 **Associate Professor**, *Computer Science Department, University of Pittsburgh*.
- 2000–2006 **Assistant Professor**, *Computer Science Department, University of Pittsburgh*.
- 2000–present **Secondary Faculty Appointment**, *Computer Engineering Program (Graduate & Undergraduate), University of Pittsburgh*.

Honors and Awards

Administrative

- 2018–2019 **ACC Academic Leaders Network**, *Office of the Provost, University of Pittsburgh*.

Research

- 2001–2002 **IBM Faculty Partnership Award**, *IBM Austin Center for Advanced Studies*.
- 2000–2001 **IBM Faculty Partnership Award**, *IBM Austin Center for Advanced Studies*.
- 1990–1991 **Honors**, *College of William and Mary*, *Source Code Compaction*.

Teaching

- 2014–2015 **CSD Teaching Award**, *CS 447 Computer Organization*.
- 2011–2012 **CSD Teaching Award**, *CS 447 Computer Organization*.
- 2009–2010 **CSD Teaching Award**, *CS 447 Computer Organization*.
- 2007–2008 **CSD Teaching Award**, *CS 1541 Introduction to Computer Architecture*.
- 2001–2002 **CSD Teaching Award**, *CS 3410 Computer Architecture Seminar*.
- 2000–2001 **CSD Teaching Award**, *CS 3410 Computer Architecture Seminar*.

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Leadership Roles and Activities

- 2018–2019 *Participant*, ACC Academic Leaders Network Program, selected participant by the Office of the Provost to build leadership capacity at the University of Pittsburgh
- 2017–present *Member*, Leadership team developing Strategic Plan for the School of Computing and Information
- 2017–present *Member*, Planning and Budgeting Committee, School of Computing and Information
- 2017–present *Member*, Provost Area Planning and Budgeting Committee, University of Pittsburgh
- 2017–present *Chair*, Tenured/Tenure-Stream Faculty Recruiting Committee, School of Computing and Information
- 2017–present *Chair*, Nontenure-Stream Faculty Recruiting Committee, School of Computing and Information
- 2017–present *Member*, Senior Vice Chancellor for Research’s Committee on Research Data Management
- 2016–2017 *Member*, Dean Search Committee for the School of Computing and Information, University of Pittsburgh
- 2015–2016 *Member*, Executive Committee, developing proposal for new campus unit of computing, University of Pittsburgh
- 2015–2016 *Co-Chair*, Research and Collaboration Committee, developing proposal for new campus unit of computing, University of Pittsburgh
- 2015–2017 *Co-director*, Graduate Computer Engineering Program, Computer Science Department
- 2013–2014 *Chair*, Faculty Recruiting committee, Computer Science Department
- 2009–2013 *Chair*, Graduate Admission and Financial Aid committee, Computer Science Department
- 2009–2013 *Director*, Graduate Studies, Computer Science Department
- 2008–2010 *Computer Science representative*, Tenure Council, Faculty of Arts and Sciences
- 2005–2009 *Chair*, Graduate Program and Examinations Committee, Computer Science Department

Sponsored Projects

Principal Investigator

- DoD *Open Center for Curation of Computer Architecture Modeling*, Bruce Childers (PI), Department of Defense (subcontract), January 2018-April 2019
- NSF *SI2-SSE: EASE: Improving Research Accountability through Artifact Evaluation*, Bruce Childers (PI), Daniel Mossé (Co-PI), National Science Foundation, Division of Advanced Cyberinfrastructure, September 2015-August 2018
- NSF *OCCAM: Open Curation for Computer Architecture Modeling*, Bruce Childers (PI), Daniel Mossé (Co-PI), Alex Jones (Co-PI), National Science Foundation, Division of Computer and Network Systems, September 2013-August 2018
- Sloan *The Impact of Emerging Platforms for Artifact Review and Active Curation on the ACM Digital Library*, Bruce Childers (PI), Alfred P. Sloan Foundation, January 2016-April 2017

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- NSF *CSR:Large: Storage Class Memory Architecture for Energy Efficient Data Centers*, Bruce Childers (PI), Sangyeun Cho (Co-PI), Rami Melhem (Co-PI), Daniel Mossé (Co-PI), Jun Yang (Co-PI), Youtao Zhang (Co-PI), National Science Foundation, Division of Computer and Network Systems, July 2010-June 2016
- NSF *Cyberinfrastructure for Computer Architecture Design and Evaluation*, Bruce Childers (PI), National Science Foundation, Division of Computing and Communication Foundations, August 15, 2011-July 2012
- NSF *Tera-PCM: A Low Power Terabyte Main Memory Using Phase Change Memory*, Bruce Childers (PI), Rami Melhem (Co-PI), Daniel Mossé (Co-PI), National Science Foundation, Division of Computing and Communication Foundations, Computer Processes and Artifacts Program, 2008-2011
- NSF *REEmact: A Robust Execution Environment for Fragile Multicore Systems*, Bruce Childers (PI at Pitt), Mahmut Kandemir (PI at PSU), Mary Jane Irwin (Co-PI at PSU), Mary Lou Soffa (PI at UVA), Jack Davidson (Co-PI at UVA), National Science Foundation, Division of Computing and Communication Foundations, Computer Processes and Artifacts Program, 2008-2011
- NSF *Yield and Reliability Enhancement for On-Chip Multicore Memories in Nanoscale Technology*, Bruce Childers (PI), Sangyeun Cho (Co-PI), National Science Foundation, Division of Computing and Communication Foundations, Computer Processes and Artifacts Program, 2007-2011
- NSF *REEmact: A Robust Execution Environment for Fragile Multicore Systems*, Bruce Childers (PI at Pitt), Mahmut Kandemir (PI at PSU), Mary Jane Irwin (Co-PI at PSU), Jack Davidson (Co-PI at UVA), Mary Lou Soffa (PI at UVA), National Science Foundation, Division of Computer and Network Systems, Computer Systems Program, 2007-2008
- NSF *A Community Resource Development Project for a Retargetable and Reconfigurable Software Dynamic Translation Infrastructure*, Bruce Childers (PI at Pitt), Jack Davidson (PI at UVA), National Science Foundation, Computing Research Infrastructure Program, 2005-2008
- NSF *Debugging Dynamic Code Modifications*, Bruce Childers (PI at Pitt), Mary Lou Soffa (PI at UVA), National Science Foundation, Division of Computer and Network Systems, Computer Systems Program, 2005-2007
- NSF *Adapting Program Code Continuously and Adaptively*, Bruce Childers (PI at Pitt), Mary Lou Soffa (PI at UVA), Jack Davidson (Co-PI at UVA), National Science Foundation, Division of Computer and Network Systems, Next Generation Software Program, 2003-2007
- Co-Principal Investigator**
- NSF *SHF: Small: A Brick in the Wall: Achieving Yield, Performance and Density Effective DRAM Beyond 22nm Technology*, Jun Yang (PI), Bruce Childers (Co-PI), Youtao Zhang (Co-PI), National Science Foundation, Division of Computer and Communication Foundations, July 2014-June 2019
- Raytheon *Memory Systems for Cognitive Architectures*, Daniel Mossé (PI), Bruce Childers (Co-PI), Raytheon, 2004-2005
- NSF *Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation*, Bruce Childers (Co-PI at Pitt), Mary Lou Soffa (PI at Pitt), Jack Davidson (PI at UVA), National Science Foundation, Next Generation Software Program, 2002-2003

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PDG *Systems-on-a-chip Education and Training*, Tom Cain (PI), Don Chiarulli (Co-PI), Bruce Childers (Co-PIT), Steven Levitan (Co-PI), Raymond Hoare (Co-PI), Ivan Kourtev (Co-PI), Pittsburgh Digital Greenhouse, 2000-2001

Other Funding

- NSF *Student Travel Support: 22nd International Conference on Parallel Architectures and Compilation Techniques (PACT 2013)*, Bruce Childers (PI), National Science Foundation, Division of Computer and Communication Foundations, 2013
- NSF *Research Experience for Undergraduates supplement to CSR:Large: Storage Class Memory Architecture for Energy Efficient Data Centers*, Bruce Childers (PI), Sangyeun Cho (Co-PI), Rami Melhem (Co-PI), Daniel Mossé (Co-PI), Jun Yang (Co-PI), Youtao Zhang (Co-PI), National Science Foundation, Division of Computer and Network Systems, 2013
- MSR *Phoenix Summer Workshop*, Bruce Childers, Microsoft Corporation, held at University of Virginia, Charlottesville, Virginia, 2007
- CRDF *Demand-driven Structural Testing*, Bruce Childers, Central Research Development Fund, University of Pittsburgh, 2005-2007
- Pitt *Jazz: A Tool for Demand-Driven Structural Testing*, Bruce Childers, Hewlett International Small Grant, University of Pittsburgh, 2005
- NSF *Research Experience for Undergraduates supplement to Adapting Program Code Continuously and Adaptively*, Bruce Childers (Co-PI) and Mary Lou Soffa (PI), National Science Foundation, 2004-2005
- IBM *SoftTest: Scalable and Flexible Software Testing of Java Programs*, Bruce Childers (Co-PI) and Mary Lou Soffa (PI), IBM Research, 2002-2003
- IBM *Power-Aware Information Appliances*, Bruce Childers, IBM Faculty Partnership Award, IBM Austin Center for Advanced Studies, 2001-2002
- IBM *Power-Aware Information Appliances*, Bruce Childers, IBM Faculty Partnership Award, IBM Austin Center for Advanced Studies, 2000-2001

Publications

Book Chapters

Dakai Zhu, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Power Aware Mapping of Real-Time Tasks to Multiprocessors”, *The Handbook of Parallel Computing: Models, Algorithms, and Applications*, Edited by Sanguthevar Rajasekaran et al., CRC Press, 2006 [B-1]

Nevine AbouGhazaleh, Daniel Mossé, Bruce Childers, and Rami Melhem, “Compilers and Operating Systems for Low Power”, Kluwer Academic Publishers, ISBN 1-4020-7573-1, 2003 [B-2]

Journal

- TODAES Xianwei Zhang, Youtao Zhang, Bruce R. Childers and Jun Yang, “On the Restore Time Variations of Future DRAM Memory”, *ACM Transactions on the Design Automation of Electronic Systems*, Volume 22, Issue 2, February 2017 [J-1]
- IJPP Musfiq Rahman and Bruce R. Childers, “Asteroid: Scalable Online Memory Diagnostics for Multi-core, Multi-socket Servers”, *Int’l. Journal of Parallel Programming*, Accepted (to appear) [J-2]

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- CAL Zhenning Wang, Jun Yang, Rami Melhem, Bruce R. Childers, Youtao Zhang, and Minyi Guo, “Simultaneous Multikernel: Fine-grained Sharing of GPUs”, *IEEE Computer Architecture Letters*, Accepted (to appear) [J-3]
- TACO Miao Zhou, Yu Du, Bruce R. Childers, Daniel Mosse, Rami Melhem, “Symmetry-agnostic Coordinated Management of the Memory Hierarchy in Multi-core Systems”, *ACM Transactions on Compiler and Architecture Optimization*, January 2016 (to appear) [J-4]
- OSR Bruce R. Childers, Alex K. Jones and Daniel Mossé, “A Roadmap and Plan of Action for Community-Supported Empirical Evaluation in Computer Architecture”, *Operating Systems Review: Special Issue on Repeatability and Sharing of Experimental Artifacts*, pp. 108–117, Vol. 49, Num. 1, January 2015 [J-5]
- SC Ryan Moore and Bruce R. Childers, “Building and Using Application Utility Models to Dynamically Choose Thread Counts”, *Journal of Supercomputing*, Springer, pp. 1184–1213, Vol. 68, Issue 3, June 2014 [J-6]
- TC Musfiq Rahman, Bruce R. Childers and Sangyeun Cho, “COMeT+: Continuous Online Memory Testing with Multi-threading Extension”, *IEEE Transactions on Computers*, Vol. 63, Issue 7, pp. 1668-1681, July 2014 [J-7]
- TACO Lei Jiang, Yu Du, Bo Zhao, Youtao Zhang, Bruce R. Childers and Jun Yang, “Hardware Assisted Cooperative Integration of Wear-leveling and Salvaging for Phase Change Memory”, *ACM Transactions on Architecture and Compiler Optimization*, Vol. 10, Issue 2, pp. 7:1-7:25, May 2013 [J-8]
- TACO Yu Du, Miao Zhou, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Delta-compressed Caching for Overcoming the Write Bandwidth Limitation of Hybrid Main Memory”, *ACM Transactions on Architecture and Compiler Optimization, Special Issue on High-Performance and Embedded Architectures and Compilers*, Berlin, Germany, Vol. 9, Issue 4, pp. 55:1-55:20, January 2013 [J-9]
- TECS José A. Baiocchi, Bruce R. Childers, Jack W. Davidson and Jason Hiser, “Enabling DBT in Embedded Systems with Scratchpad Memory”, *ACM Transactions on Embedded Computing Systems*, Vol. 11, Issue 4, pp. 89:1-89:33, December 2012 [J-10]
- TACO Miao Zhou, Santiago Bock, Alexandre Ferreira, Bruce R. Childers, Daniel Mossé, and Rami Melhem, “Writeback-aware Partitioning and Replacement for Last-Level Caches in Phase Change Main Memory Systems”, *ACM Transactions on Architecture and Compiler Optimization, Special Issue on High-Performance and Embedded Architectures and Compilers*, Paris, France, Vol. 8, Issue 4, 53:1-53:21, January 2012 [J-11]
- TACO Jason D. Hiser, Daniel W. Williams, Wei Hu, Jack W. Davidson, Jason Mars and Bruce R. Childers, “Evaluating Indirect Branch Handling Mechanisms in Software Dynamic Translation Systems”, *ACM Transactions on Architecture and Compiler Optimization*, Vol. 8, Num. 2, pp. 9:1-9:28, June 2011 [J-12]
- TACO Hyunjin Lee, Sangyeun Cho and Bruce R. Childers, “DEF-CAM: A Design and Evaluation Framework for Defect-Tolerant Cache Memories”, *ACM Transactions on Architecture and Compiler Optimization*, Accepted June 2011, appeared in Vol. 8, Num. 3, pp. 17:1-17:29, October 2011. [J-13]
- TOPLAS Yuqiang Huang, Bruce R. Childers and Mary Lou Soffa, “Detecting Bugs in Register Allocation”, *ACM Transactions on Programming Languages and Systems*, Vol. 32, Num. 4, pp. 15:1-15:36, April 2010 [J-14]

- TC Hyunjin Lee, Sangyeun Cho and Bruce R. Childers, “PERFECTION: A Fault-Tolerant Directory Memory Architecture”, *IEEE Transactions on Computers*, Accepted May 2009, appeared in Vol. 59, Num. 5, pp. 638-650, May 2010 [J-15]
- HPSA Mauricio L. Pilla, Bruce R. Childers, Felipe M.G. Franca, Amarildo T. Da Costa, Philippe O.A. Navaux, “Limits for a feasible speculative trace reuse implementation”, *Int'l. Journal of High Performance Systems Architecture*, InderScience Publishers, Vol. 1, Num. 1, pp. 69-76, 2007 [J-16]
- TC Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Near-Memory Caching for Improved Energy Consumption”, *IEEE Transactions on Computers*, Vol. 56, Num. 11, pp. 1441-1455, November 2007 [J-17]
- TACO Min Zhao, Bruce R. Childers, and Mary Lou Soffa, “An Approach toward Profit-driven Optimization”, *ACM Transactions on Architecture and Compiler Optimization*, Accepted May 2006, appeared in Vol. 3, Num. 3, pp. 231-262, September 2006 [J-18]
- IJES Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé, Rami Melhem, “Power Management in External Memory using Power-Aware Cached-DRAM”, *Int'l. Journal on Embedded Systems*, Accepted January 2006, appeared in Vol. 3, Num. 1/2, pp. 65-72, InderScience, 2007 [J-19]
- TECS Nevine AbouGhazaleh, Daniel Mossé, Bruce R. Childers, and Rami Melhem, “Collaborative Operating System and Compiler Power Management for Real-Time Applications”, *ACM Transactions on Embedded Computing Systems*, appeared in Vol. 5, Num. 1, pp. 82-115, February 2006 [J-20]
- IJPP Naveen Kumar, Bruce R. Childers, Daniel Williams, Jack W. Davidson, and Mary Lou Soffa, “Compile-time planning for overhead reduction in software dynamic translators”, *Int'l. Journal on Parallel Programming*, appeared in Vol. 33, Num. 2/3, pp. 103-114, June 2005 [J-21]
- JMM Bruce R. Childers and Jack W. Davidson, “An Infrastructure for Designing Custom Embedded Wide Counterflow Pipelines”, *Journal of Microprocessors and Microsystems*, Accepted July 2004, appeared in Vol. 29, Num. 1, pp. 27-40, February 2005 [J-22]
- TC Bruce R. Childers and Jack W. Davidson, “Custom Wide Counterflow Pipelines for High Performance Embedded Applications”, *IEEE Transactions on Computers*, Accepted January 2003, appeared in Vol. 53, Num. 2, pp. 141-158, February 2004 [J-23]
- TPDS Daki Zhu, Rami Melhem and Bruce R. Childers, “Scheduling with Dynamic Voltage/Speed Adjustment Using Slack Reclamation in Multi-processor Real-Time Systems”, *IEEE Transactions on Parallel and Distributed Systems*, Accepted January 2003, appeared in Vol. 14, Num. 7, pp. 686-700, July 2003 [J-24]
- [Conference \(Refereed\)](#)
- CF Cheng Qian, Bruce R. Childers, Libo Huang, Qi Yu and Zhiying Wang, “CMH: Compression Management for Improving Capacity in the Hybrid Memory Cube”, *ACM Int'l. Conf. on Computing Frontiers*, May 2018 [C-1]
- ICDE Bruce R. Childers and Panos Chrysanthis, “Artifact Evaluation: FAD or Real News?”, *Int'l. Conf. on Data Engineering*, April 2018 (abstract) [C-2]
- ISPASS Cheng Qian, Bruce R. Childers, Libo Huang, Qi Yu and Zhiying Wang, “HMCSP: Reducing Transaction Latency of CSR-based SPMV in Hybrid Memory Cube”, *IEEE Int'l. Symp. on Performance Analysis of Systems and Software*, April 2018 (short) [C-3]

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- PACT Xianwei Zhang, Youtao Zhang, Bruce R. Childers and Jun Yang, “DrMP: Mixed Precision-Aware DRAM for High Performance Approximate and Precise Computing”, *Conf. on Parallel Compilation and Architecture Techniques*, September 2017 [C-4]
- ESCI Bruce R. Childers and Panos Chrysanthis, “Artifact Evaluation: Is It a Real Incentive?”, *eScience*, October 2017 [C-5]
- Gateways Bruce R. Childers, Daniel Mosse’, and David Wilkinson, “Evaluating Interactive Archives”, *Gateways*, October 2017 [C-6]
- ISCA Zhenning Wang, Jun Yang, Rami Melhem, Bruce R. Childers, Youtao Zhang and Minyi Guo, “Quality of Service Support for Fine-Grained Sharing on GPUs”, *Int’l. Symp. on Computer Architecture*, June 2017 [C-7]
- ICCD Santiago Bock, Bruce Childers, Rami Melhem and Daniel Mosse’, “Concurrent Migration of Multiple Pages in Software-Managed Hybrid Main Memory”, *Int’l. Conf. on Computer Design*, October 2016 [C-8]
- MEMSYS Xianwei Zhang, Youtao Zhang, Bruce R. Childers and Jun Yang, “AWARD: Approximate-aWARE Restore in Further Scaling DRAM”, *Int’l. Symp. on Memory Systems*, Alexandria, Virginia, October 2016 [C-9]
- NVMSA Chi Zhang, Wonsun Ahn, Youtao Zhang and Bruce R. Childers, “Live Code Update for IoT Devices in Energy Harvesting Environments”, *IEEE Nonvolatile Memory Systems and Applications Symp.*, Daegu, Korea, August 2016 [C-10]
- HPCA Xianwei Zhang, Youtao Zhang, Bruce R. Childers and Jun Yang, “Restore Truncation for Performance Improvement in Future DRAM Systems”, *IEEE the 22nd Int’l. Symp. on High-Performance Computer Architecture*, Barcelona, Spain, March 2016 [C-11]
- HPCA Zhenning Wang, Jun Yang, Rami Melhem, Bruce R. Childers, Youtao Zhang, and Minyi Guo, “Simultaneous Multikernel GPU: Multi-tasking Throughput Processors via Fine-Grained Sharing”, *IEEE the 22nd Int’l. Symp. on High-Performance Computer Architecture*, Barcelona, Spain, March 2016 [C-12]
- MASCOTS Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Characterizing the Overhead of Software-Managed Hybrid Main Memory”, *IEEE Int’l. Symp. on Modeling, Analysis and Simulation of Computer and Telecommunication Systems*, Atlanta, Georgia, October 2015 [C-13]
- MEMSYS Bruce R. Childers, Jun Yang and Youtao Zhang, “Achieving Yield, Density and Performance Effective DRAM at Extreme Technology Sizes”, *Int’l. Symp. on Memory Systems*, Alexandria, Virginia, October 2015 [C-14]
- MEMSYS Brian Kocoloski, Yuyu Zhou and Bruce R. Childers, “Implications of Memory Interference for Composed HPC Applications”, *Int’l. Symp. on Memory Systems*, Washington, DC, October 2015 (abstract) [C-15]
- NVMSA Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mossé, “HMMSim: A Simulator for Hardware-Software Co-Design of Hybrid Main Memory”, *IEEE Nonvolatile Memory Systems and Applications Symp.*, Hong Kong, August 2015 [C-16]
- NVMSA Chelsea Mafrica, John Johnson, Santiago Bock, Thao Pham, Bruce R. Childers, Panos Chrysanthis and Alexandros Labrinidis, “Stream Query Processing on Emerging Memory Architectures”, *IEEE Nonvolatile Memory Systems and Applications Symp.*, Hong Kong, August 2015 [C-17]
- ICCESS Ryan Moore, Bruce Childers and Jingling Xue, “Performance Modeling of Multi-threaded Programs for Mobile Asymmetric Chip Multiprocessors”, *IEEE Int’l. Conf. on Embedded Software and Systems*, New York City, New York, August 2015 [C-18]

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- CF Musfiq Rahman and Bruce R. Childers, “Asteroid: Scalable Online Memory Diagnostics”, *ACM Int’l. Conf. on Computing Frontiers*, pp. 15:1–15:8, Ischia, Italy, May 2015 [C–19]
- CF Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Understanding the Limiting Factors of Page Migration in Hybrid Main Memory”, *ACM Int’l. Conf. on Computing Frontiers*, pp. 45:1–45:2, Ischia, Italy, May 2015 (short) [C–20]
- DATE Xianwei Zhang, Youtao Zhang, Bruce R. Childers and Jun Yang, “Exploiting DRAM Restore Time Variations in Deep Sub-micron Scaling”, *Design, Automation and Test in Europe*, pp. 477–482, Grenoble, France, March 2015 [C–21]
- HPCA Yu Du, Miao Zhou, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Supporting Superpages in Non-Contiguous Physical Memory”, *IEEE Int’l. Symp. on High Performance Computer Architecture*, pp. 223–234, San Francisco Bay Area, CA, February 2015 [C–22]
- CF Santiago Bock, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Concurrent Page Migration for Mobile Systems with OS-Managed Hybrid Memory”, *ACM Int’l. Conf. on Computing Frontiers*, pp. 31:1–31:10, Cagliari, Italy, May 2014 [C–23]
- DATE Ryan Moore and Bruce R. Childers, “Program Affinity Performance Models for Performance and Utilization”, *Design Automation and Test in Europe*, pp. 1–4, Dresden, Germany (interactive), March 2014 [C–24]
- PACT Miao Zhou, Yu Du, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Writeback-Aware Bandwidth Partitioning for Multi-core Systems with PCM”, *Int’l. Conf. on Parallel Architecture and Compilation Techniques*, pp. 113–122, Edinburgh, Scotland, September 2013 [C–25]
- ISCA Yu Du, Miao Zhou, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Bit Mapping for Balanced PCM Programming”, *Int’l. Symp. on Computer Architecture*, pp. 428–439, Tel Aviv, Israel, June 2013 [C–26]
- CC Ryan Moore and Bruce R. Childers, “Automatic Generation of Program Affinity Policies using Machine Learning”, *Int’l. Conf. on Compiler Construction*, pp. 184–203, Rome, Italy, March 2013 [C–27]
- MICRO Lei Jiang, Youtao Zhang, Bruce R. Childers and Jun Yang, “FPB: Fine-grained Power Budgeting to Improve Write Throughput of Multi-level Phase Change Memory”, *45th Annual IEEE/ACM Int’l. Symposium on Microarchitecture*, pp. 1–12, Vancouver, Canada, December 2012 [C–28]
- ISPASS Ryan Moore and Bruce R. Childers, “Using Utility Prediction Models to Dynamically Choose Program Thread Counts”, *IEEE Int’l. Symp. on Performance Analysis of Systems and Software*, pp. 135–144, New Brunswick, New Jersey, April 2012 [C–29]
- VEE Tanima Dey, Wei Wang, Ryan Moore, Mahmut Aktasoglu, Bruce R. Childers, Jack W. Davidson, Mary Jane Irwin, Mahmut Kandemir, Mary Lou Soffa, “REEEact: A Customizable Virtual Execution Manager for Multicore Platforms”, *ACM Int’l. Conf. on Virtual Execution Environments*, pp. 27–38, London, United Kingdom, March 2012 [C–30]
- HPCA Lei Jiang, Bo Zhao, Youtao Zhang, Jun Yang, and Bruce R. Childers, “Improving Write Operations in MLC Phase Change Memory”, *18th Int’l. Symp. on High-Performance Computer Architecture*, pp. 1–10, New Orleans, Louisiana, February 2012 [C–31]

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- ICISS Miao Zhou, Santiago Bock, Alexandre Ferreira, Bruce R. Childers, Daniel Mossé, and Rami Melhem, “Real-Time Scheduling for Phase Change Main Memory Systems”, *8th IEEE Int’l. Conf. on Embedded Software and Systems*, pp. 991–998, Changsha, China (received **Best Paper Award**), November 2011 [C–32]
- PRDC Musfiq Rahman, Bruce R. Childers and Sangyeun Cho, “COMeT: Continuous Online Memory Test”, *17th IEEE Pacific Rim Int’l. Symp. on Dependable Computing*, pp. 109–118, Pasadena, California, December 2011 [C–33]
- PPPJ Jonathan Misurda, Bruce R. Childers and Mary Lou Soffa, “Jazz2: A Flexible and Extensible Framework for Structural Testing in a Java VM”, *9th Int’l. Conf. on the Principles and Practice of Programming in Java*, pp. 81–90, Copenhagen, Denmark, August 2011 [C–34]
- DSN Lei Jiang, Yu Du, Youtao Zhang, Bruce R. Childers and Jun Yang, “LLS: Cooperative Integration of Wear-Leveling and Salvaging for PCM Main Memory”, *41st Int’l. Conf. on Dependable Systems and Networks*, pp. 221–232, Hong Kong, China, June 2011 [C–35]
- SEAMS Ryan Moore and Bruce R. Childers, “Inflation and Deflation of Self-Adaptive Applications”, *6th Int’l. Symp. on Software Engineering for Adaptive and Self-Managing Systems*, pp. 228–237, Waikiki, Honolulu, Hawaii, May 2011 [C–36]
- ISPASS Santiago Bock, Bruce R. Childers, Rami Melhem, Daniel Mossé, and Youtao Zhang, “Analyzing the Impact of Useless Write-backs on Endurance and Energy Consumption of PCM Main Memory”, *IEEE Int’l. Symp. on Performance Analysis of Systems and Software*, pp. 56–65, Austin, Texas, April 2011 [C–37]
- HPCA Hyunjin Lee, Sangyeun Cho and Bruce R. Childers, “CloudCache: Expanding and Shrinking Private Caches”, *17th Int’l. Symp. on High-Performance Computer Architecture*, pp. 219–230, San Antonio, Texas, February 2011 [C–38]
- DATE José A. Baiocchi and Bruce R. Childers, “Demand Code Paging for NAND Flash in MMU-less Embedded Systems”, *Design Automation and Test in Europe*, Grenoble, France, March 2011 [C–39]
- DATE Alexandre Ferreira, Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Impact of Process Variation on Endurance Algorithms for Wear-Prone Memories”, *Design Automation and Test in Europe*, Grenoble, France, March 2011 [C–40]
- RV Musfiq Rahman, Bruce R. Childers and Sangyeun Cho, “StealthWorks: Emulating Errors in Memory”, *Int’l. Conf. on Runtime Verification*, pp. 360–367, Malta, November 2010 (Tool paper) [C–41]
- RTAS Alexandre P. Ferreira, Bruce R. Childers, Rami Melhem, Daniel Mossé and Mazin Yousif, “Using PCM in Next-Generation Embedded Space Applications”, *IEEE Real-Time and Embedded Technology and Applications Symp.*, pp. 153–162, Stockholm, Sweden, April 2010 [C–42]
- DATE Alexandre P. Ferreira, Miao Zhou, Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Increasing PCM Main Memory Lifetime”, *Design, Automation and Test in Europe*, pp. 914–919, Dresden, Germany, March 2010 [C–43]
- HPCA Hyunjin Lee, Sangyeun Cho and Bruce R. Childers, “StimulusCache: Boosting Performance of Chip Multiprocessors with Excess Cache”, *16th Int’l. Symp. on High-Performance Computer Architecture*, pp. 1–12, Bangalore, India, January 2010 [C–44]

- DAC José A. Baiocchi and Bruce R. Childers, “Heterogeneous Code Cache: Using Scratchpad and Main Memory in Dynamic Binary Translators”, *46th Design Automation Conf.*, pp. 744–749, San Francisco, California, July 2009 [C–45]
- DCOSS Weijia Li, Youtao Zhang and Bruce Childers, “MCP: An Energy-Efficient Code Distribution Protocol for Multi-Application WSNs”, *Int’l. Conf. on Distributed Computing in Sensor Systems*, pp. 259–272, Marina Del Rey, California, June 2009 [C–46]
- LCTES Ryan W. Moore, José A. Baiocchi, Bruce R. Childers, Jack W. Davidson, Jason D. Hiser, “Addressing the Challenges of DBT for the ARM Architecture”, *ACM Conf. on Languages, Compilers and Tools for Embedded Systems*, pp. 147–156, Dublin, Ireland, June 2009 [C–47]
- CC Min Zhao, Bruce R. Childers, Mary Lou Soffa, “A Framework for Exploring Optimization Properties”, *Int’l. Conf. on Compiler Construction*, pp. 32–47, York, United Kingdom, March 2009 [C–48]
- CGO Naveen Kumar, Bruce R. Childers, Mary Lou Soffa, “Transparent Debugging of Dynamically Optimized Code”, *ACM/IEEE Int’l. Symp. on Code Generation and Optimization*, pp. 275–286, Seattle, Washington, March 2009 [C–49]
- CASES José A. Baiocchi, Bruce R. Childers, Jack W. Davidson and Jason Hiser, “Reducing Pressure in Bounded DBT Code Caches”, *Int’l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems*, pp. 109–118, Atlanta, Georgia, October 2008 [C–50]
- VEE Takashi Okumura, Bruce Childers and Daniel Mossé, “Running a Java VM inside an Operating System Kernel: A Networking Case Study”, *ACM Int’l. Conf. on Virtual Execution Environments*, pp. 168–173, Seattle, Washington, March 2008 [C–51]
- HiPEAC Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé, and Rami Melhem, “Integrated CPU and Cache Power Management”, *Int’l. Conf. on High-Performance Embedded Architectures and Compilers*, pp. 209–223, Goteborg, Sweden, January 2008 [C–52]
- EUC Weijia Li, Yu Du, Youtao Zhang, Bruce Childers, Ping Zhou, and Jun Yang, “Adaptive Buffer Management for Efficient Code Dissemination in Multi-Application Wireless Sensor Networks”, *IEEE Int’l. Conf. on Embedded and Ubiquitous Computing*, pp. 295–301, Shanghai, China, December 2008 [C–53]
- ICCD Hyunjin Lee, Sangyeun Cho, and Bruce R. Childers, “Exploring the Interplay of Yield, Area and Performance in Processor Caches”, *IEEE Int’l. Conf. on Computer Design*, pp. 216–223, Lake Tahoe, CA, October 2007 [C–54]
- CASES José A. Baiocchi, Bruce R. Childers, Jack W. Davidson, Jason Hiser and Jonathan Misurda, “Fragment Cache Management for Dynamic Binary Translators in Embedded Systems with Scratchpad”, *Int’l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems*, pp. 75–84, Salzburg, Austria, October 2007 [C–55]
- LCTES Nevine AbouGhazaleh, Alexandre Ferreira, Frank Liberato, Bruce R. Childers, Daniel Mossé and Rami Melhem, “Integrated CPU and L2 Cache Voltage Scaling using Machine Learning”, *ACM Conf. on Languages, Compilers, and Tools for Embedded Systems*, pp. 41–50, San Diego, California, June 2007 [C–56]
- ISVLSI Hyunjin Lee, Sangyeun Cho and Bruce R. Childers, “Performance of Graceful Degradation for Cache Faults”, *IEEE Int’l. Symp. on VLSI*, pp. 409–415, Porto Alegre, Brazil, May 2007 [C–57]

- CGO Jason D. Hiser, Daniel Williams, Wei Hu, Jack W. Davidson, Jason Mars, Bruce R. Childers, “Evaluating Indirect Branch Handling Mechanisms in Software Dynamic Translation Systems”, *ACM/IEEE Int’l. Symp. on Code Generation and Optimization*, pp. 61–73, San Jose, California, March 2007 [C–58]
- SBAC-PAD Mauricio Pilla, Bruce R. Childers, Philippe Navaux, Felipe Franca, and Amarildo da Costa, “A Speculative Trace Reuse Architecture with Reduced Hardware Requirements”, *IEEE Int’l. Symp. on Computer Architecture and High Performance Computing (SBAC-PAD)*, pp. 47–54, Oureto, Brazil, October 2006 [C–59]
- SAS Yuqiang Huang, Bruce R. Childers, and Mary Lou Soffa, “Catching and Identifying Bugs in Register Allocation”, *Int’l. Static Analysis Symp.*, pp. 281–300, Seoul, Korea, August 2006 [C–60]
- VEE Jason D. Hiser, Daniel Williams, Adrian Filipi, Jack W. Davidson, and Bruce R. Childers, “Evaluating Fragment Creation Policies for SDT Systems”, *Int’l. Conf. on Virtual Execution Environments*, pp. 122–132, Ottawa, Canada, June 2006 [C–61]
- ICCD Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé, Rami Melhem, “Near-memory Caching for Improved Energy Consumption”, *IEEE Int’l. Conf. on Computer Design*, pp. 105–108, San Jose, California, October 2005 [C–62]
- AADEBUG Naveen Kumar, Bruce R. Childers, and Mary Lou Soffa, “TDB: A Source-Level Debugger for Dynamically Translated Programs”, *ACM Sixth Int’l. Symp. on Automated and Analysis-Driven Debugging*, pp. 123–132, Monterey, California, September 2005 [C–63]
- VEE Shukang Zhou, Bruce R. Childers, Mary Lou Soffa, “Planning for Code Buffer Management in Distributed Virtual Execution Environments”, *ACM/USENIX Conf. on Virtual Execution Environments*, pp. 100–109, Chicago, Illinois, June 2005 [C–64]
- CC J. Misurda, J. Clause, J. L. Reed, P. Gandra, B. R. Childers, and M. L. Soffa, “Jazz: A tool for demand-driven structural testing”, *14th ETAPS Int’l. Conf. on Compiler Construction*, pp. 242–245, Edinburgh, Scotland, April 2005 (Tool paper) [C–65]
- ICSE Jonathan Misurda, James Clause, Juliya L. Reed, Bruce R. Childers, Mary Lou Soffa, “Demand-driven structural testing with dynamic instrumentation”, *ACM SIGSOFT Int’l. Conf. on Software Engineering*, pp. 156–165, St. Louis, Missouri, May 2005 [C–66]
- CGO Min Zhao, Bruce R. Childers, Mary Lou Soffa, “A Model-based Framework: An Approach to Profit-Driven Optimization”, *ACM/IEEE Int’l. Conf. on Code Generation and Optimization*, pp. 317–327, San Jose, California, March 2005 [C–67]
- SBAC-PAD Maurico L. Pilla, Philippe O. A. Navaux, Bruce R. Childers, Amarildo T. da Costa, and Felipe M. G. Franca, “Value Predictors for Reuse through Speculation on Traces”, *IEEE 16th Symp. on Computer Architecture and High Performance Computing (SBAC-PAD)*, pp. 47–54, Foz do Igauçu, Brazil, October 2004 [C–68]
- DATE Shukang Zhou, Bruce R. Childers and Naveen Kumar, “Profile Guided Management of Code Partitions for Embedded Systems”, *Conf. on Design, Automation and Test in Europe*, pp. 1396–1399 (Vol. 2), Paris, France, February 2004 (short) [C–69]
- SBAC-PAD Mauricio L. Pilla, Philippe O. A. Navaux, Amarildo T. da Costa, Felipe M. G. Franca, Bruce R. Childers, Mary Lou Soffa, “The Limits of Speculative Trace Reuse on Deeply Pipelined Processors”, *IEEE 15th Symp. on Computer Architecture and High Performance Computing (SBAC-PAD)*, pp. 36–44, Sao Paulo/SP, Brazil, November 2003 [C–70]

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- LCTES Min Zhao, Bruce R. Childers, and Mary Lou Soffa, “Predicting the Impact of Optimizations for Embedded Systems”, *ACM Conf. on Languages, Compilers, and Tools for Embedded Systems*, pp. 1–11, San Diego, California, June 2003 [C–71]
- LCTES Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé, Rami Melhem, and Matt Craven, “Energy Management for Real-Time Embedded Applications with Compiler Support”, *ACM Conf. on Languages, Compilers, and Tools for Embedded Systems*, pp. 284–293, San Diego, California, June 2003 [C–72]
- RTAS Nevine AbouGhazaleh, Daniel Mossé, Bruce R. Childers, Rami Melhem, and Matt Craven, “Collaborative Operating System and Compiler Power Management for Real-Time Applications”, *IEEE Real-Time/Embedded Technology and Applications Symp.*, pp. 133–141, Washington, DC, May 2003 [C–73]
- MSE Ivan Kourtev, Ray Hoare, Steve Levitan, Tom Cain, Bruce Childers, and Don Chiarulli, “Short Courses in System-on-a-Chip (SoC) Design”, *IEEE Int’l. Conf. on Microelectronic Systems Education*, pp. 126–127, Anaheim, California, June 2003 [C–74]
- CGO K. Scott, N. Kumar, S. Velusamy, B. Childers, J. Davidson, and M. L. Soffa, “Retargetable and Reconfigurable Software Dynamic Translation”, *ACM SIGMICRO Int’l. Conf. on Code Generation and Optimization*, pp. 36–47, San Francisco, California, March 2003 [C–75]
- RTSS Daki Zhu, Rami Melhem and Bruce R. Childers, “Scheduling with Dynamic Voltage/Speed Adjustment Using Slack Reclamation in Multi-Processor Real-Time Systems”, *22nd IEEE Real-Time Systems Symp.*, pp. 84–94, London, UK, December 2001 [C–76]
- PACT Bruce R. Childers and Jack W. Davidson, “Custom Wide Counterflow Pipelines for High-Performance Embedded Applications”, *Int’l. Conf. on Parallel Architecture and Compilation Techniques*, pp. 57–68, October 2000 [C–77]
- HICSS Bruce R. Childers and Jack W. Davidson, “An Infrastructure for Designing Custom Embedded Counterflow Pipelines”, *Hawaii Int’l. Conf. on System Sciences*, pp. 1530–1605 (Vol. 8), Maui, Hawaii, January 2000 [C–78]
- ARVLSI Bruce R. Childers and Jack W. Davidson, “Architectural Considerations for Application-Specific Counterflow Pipelines”, *IEEE Conf. on Adv. Research in VLSI*, pp. 3–22, Atlanta, Georgia, March 1999 [C–79]
- HICSS Michael A. Alexander, Mark W. Bailey, Bruce R. Childers, Jack W. Davidson and Sanjay Jinturkar, “Memory Bandwidth Optimizations for Wide-Bus Machines”, *Hawaii Int’l. Conf. on System Sciences*, pp. 466–475 (Vol. 1), January 1993 [C–80]
- [Workshop \(Refereed\)](#)
- P-RECS David Wilkinson, Luis Oliveira, Daniel Mosse, Bruce Childers, “Software Provenance: Track the Reality Not the Virtual Machine”, *First Int’l. Workshop on Practical Reproducible Evaluation of Computer Systems (P-RECS)*, Phoenix, Arizona, June 2018 [W–1]
- P-RECS Luis Oliveira, David Wilkinson, Daniel Mosse, Bruce Childers, “Supporting Long-term Reproducible Software Execution”, *First Int’l. Workshop on Practical Reproducible Evaluation of Computer Systems (P-RECS)*, Phoenix, Arizona, June 2018 [W–2]
- NVMW Santiago Bock, Bruce R. Childers, Rami Melhem and Daniel Mosse’, “Characterizing the Overhead of Software-Managed Hybrid Main Memory”, *7th Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of MAS-COTS 2015 paper), March 2016 [W–3]

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- NVMW Yu Du, Miao Zhou, Bruce R. Childers, Rami Melhem, and Daniel Mossé, “Bit Mapping for Balanced PCM Cell Programming”, *5th Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of ISCA 2013 paper), March 2014 [W-4]
- NVMW Miao Zhou, Yu Du, Bruce R. Childers, Rami Melhem, and Daniel Mossé, “Writeback-Aware Bandwidth Partitioning for Multi-core Systems with PCM”, *5th Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of PACT 2013 paper), March 2014 [W-5]
- NVMW Lei Jiang, Youtao Zhang, Bruce R. Childers and Jun Yang, “FPB: Fine-grained Power Budgeting to Improve Write Throughput of Multi-level Phase Change Memory”, *4th Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of MICRO 2012 paper), March 2013 [W-6]
- NVMW Lei Jiang, Bo Zhao, Youtao Zhang, Jun Yang, and Bruce R. Childers, “Improving Write Operations in MLC Phase Change Memory”, *3rd Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of HPCA 2012 paper), March 2012 [W-7]
- NVMW Miao Zhou, Santiago Bock, Alexandre Ferreira, Bruce R. Childers, Daniel Mossé, and Rami Melhem, “Writeback-aware Partitioning and Replacement for Last-Level Caches in Phase Change Main Memory Systems”, *3rd Annual Non-volatile Memories Workshop*, San Diego, California (short version for presentation of HiPEAC 2012 paper), March 2012 [W-8]
- SMART Nevine AbouGhazaleh, Alexandre Ferreira, Cosmin Rusu, Ruibin Xu, Bruce R. Childers, Rami Melhem and Daniel Mossé, “Integrated CPU and L2 Cache Frequency/Voltage Scaling using Supervised Learning”, *HiPEAC Workshop on Statistical and Machine Learning Approaches Applied to Architectures and Compilation*, Ghent, Belgium, January 2007 [W-9]
- WOSS Naveen Kumar, Jonathan Misurda, Bruce R. Childers, and Mary Lou Soffa, “Instrumentation in Software Dynamic Translators for Self-Managed Systems”, *ACM SIGSOFT Workshop on Self-Managed Systems*, pp. 90–94, Long Beach, California, October 2004 [W-10]
- ETX B. R. Childers, M. L. Soffa, J. Beaver, L. Ber, K. Cammarata, T. Kane, J. Litman, and J. Misurda, “SoftTest: A framework for software testing of Java programs”, *Eclipse Technology Exchange Workshop*, Anaheim, California, October 27, 2003 [W-11]
- Traces Naveen Kumar and Bruce R. Childers, “Flexible Instrumentation for Software Dynamic Translation”, *Workshop on Exploring the Trace Space for Dynamic Optimization Techniques*, San Francisco, California, June 2003 [W-12]
- COLP Nevine AbouGhazaleh, Daniel Mossé, Bruce R. Childers, and Rami Melhem, “Toward The Placement of Power Management Points in Real Time Applications”, *Workshop on Compilers and Operating Systems for Low Power*, October 2001 [W-13]
- Koolchips Bruce R. Childers, Hongliang Tang and Rami Melhem, “Adapting Processor Supply Voltage to Instruction-Level Parallelism”, *Koolchips Workshop*, Monterey, California, December 2000 [W-14]
- FDDO Tarun Nakra, Bruce R. Childers, and Mary Lou Soffa, “Width-Sensitive Scheduling for Resource Constrained VLIW Processors”, *ACM Workshop on Feedback-Directed and Dynamic Optimization*, Monterey, California, December 2000 [W-15]

- COLP Daniel Mossé, Hakan Aydin, Bruce R. Childers, and Rami Melhem, “Compiler-Assisted Dynamic Power-Aware Scheduling for Real-Time Applications”, *Workshop on Compilers and Operating Systems for Low Power*, Philadelphia, Pennsylvania, October 2000 [W-16]
- LCTES Bruce R. Childers and Tarun Nakra, “Reordering Memory Bus Transactions for Reduced Energy Consumption”, *ACM SIGPLAN Workshop on Languages, Compilers, and Tools for Embedded Systems*, pp. 146–161, Vancouver, Canada, June 2000 [W-17]
- CASES Bruce R. Childers and Jack W. Davidson, “Automatic Architectural Design of Wide-Issue Counterflow Pipelines”, *Workshop on Compiler and Architecture Support for Embedded Systems*, Washington, DC, 1999 [W-18]
- LCTES Bruce R. Childers and Jack W. Davidson, “A Design Environment for Counterflow Pipeline Synthesis”, *ACM SIGPLAN Workshop on Languages, Compilers, and Tools for Embedded Systems*, pp. 223–234 (Vol. 1474), Lecture Notes in Computer Science, Springer, June 1998 [W-19]
- INTERACT Bruce R. Childers, Jack W. Davidson, and Wm. Wulf, “Synthesis of Application-Specific Counterflow Pipelines”, *Workshop on Interaction between Compilers and Computer Architecture*, San Jose, California, February 1996 [W-20]

Invited and Other Publications

- ACM David Wilkinson, Bruce Childers, Bernard Rous, Wayne Graves and Jack Davidson, “ACM Pilot Demo 1 - Collective Knowledge: Packing and Sharing, Version 3”, *Video available from the ACM Digital Library*, 2017, DOI: <https://dl.acm.org/citation.cfm?doid=3068854> [I-1]
- ACM David Wilkinson, Bruce Childers, Bernard Rous, Wayne Graves and Jack Davidson, “ACM Pilot Demo 2 - OCCAM: Sharing and Modification, Version 3”, *Video available from the ACM Digital Library*, 2017, DOI: <https://dl.acm.org/citation.cfm?doid=3076215> [I-2]
- ACM David Wilkinson, Bruce Childers, Bernard Rous, Wayne Graves and Jack Davidson, “ACM Pilot Demo 3 - Code Ocean: Code Modification and Derivation, Version 3”, *Video available from the ACM Digital Library*, 2017, DOI: <https://dl.acm.org/citation.cfm?doid=3076216> [I-3]
- Dagstuhl Bruce R. Childers, Grigori Fursin, Shriram Krishnamurthi, Andreas Zeller, “Artifact Evaluation for Publications, Dagstuhl Perspectives Workshop 15452”, *Dagstuhl Reports Vol. 5, Num. 11, pp. 29-35*, 2015 [I-4]
- NGS Apala Guha, Jason D. Hiser, Naveen Kumar, Jing Yang, Min Zhao, Shukang Zhou, Bruce R. Childers, Jack W. Davidson, Kim Hazelwood, and Mary Lou Soffa, “Virtual Execution Environments: Support and Tools”, *Workshop on Next Generation Software, Int'l. Symp. on Parallel and Distributed Systems*, pp. 1–6, Long Beach, California, March 2007 [I-5]
- NGS Jason D. Hiser, Naveen Kumar, Min Zhao, Shukang Zhao, Bruce R. Childers, Jack W. Davidson and Mary Lou Soffa, “Techniques and Tools for Dynamic Optimization”, *NSF Next Generation Software Workshop*, Manhattan Beach, California, April 2006 [I-6]
- Dagstuhl Nevine AbouGhazaleh, Bruce R. Childers, Daniel Mossé, Rami Melhem, “Energy Conservation in Memory Hierarchies using Power-Aware Cached-DRAM”, *Proceedings of the Schloss Dagstuhl Seminar on Power-Aware Computing Systems*, June 2005 [I-7]

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- NGS Kevin Scott, Naveen Kumar, Bruce R. Childers, Jack W. Davidson, and Mary Lou Soffa, “Overhead reduction techniques for software dynamic translation”, *NSF Next Generation Software Workshop, Int’l. Parallel and Distributed Processing Symp.*, Santa Fe, New Mexico, April 2004 [I–8]
- NGS Bruce R. Childers, Jack W. Davidson and Mary Lou Soffa, “Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation”, *NSF Next Generation Software Workshop, Int’l. Parallel and Distributed Processing Symp.*, Nice, France, April 2003 [I–9]

Keynote, Invited, and Other Presentations

Using Workflows for Reproducible Computationally-Driven Science, SAC-PA: Towards Security Assured Cyberinfrastructure in Pennsylvania, Pittsburgh, Pennsylvania (Keynote), June 14, 2018

Workflow Systems: OCCAM, Modeling the World’s Systems Conference, Pittsburgh, Pennsylvania (Invited), May 22, 2018

Dynamic Curation of Artifacts and Experiments is Changing the Way Digital Libraries will Operate, ACM Workshop on Data, Software and Reproducibility in Publication, New York, New York (Invited), December 7, 2017

Achieving Scientific Reproducibility for Computer Science, College of William and Mary, Williamsburg, Virginia (Invited for Homecoming Weekend), October 20, 2017

Learning to Share: Open, Reusable, and Accountable Experiments for Embedded Systems, 16th IEEE International Conference On Trust, Security And Privacy In Computing And Communications, Sydney, Australia (Keynote), August 4, 2017

We Must Learn to Share! Using OCCAM to Accelerate Computer Systems Research, ARM Research Summit, Cambridge, UK, September 15, 2016

Composing, Reproducing and Sharing Simulations, Workshop on Modeling and Simulation of Systems and Applications (ModSim), Seattle, Washington, August 10, 2016

Achieving Yield, Density and Performance Effective DRAM at Extreme Technology Sizes, ACM Conference on Languages, Compilers and Tools for Embedded Systems (LCTES), Santa Barbara, California (Keynote), June 14, 2016

Achieving Yield, Density and Performance Effective DRAM at Extreme Technology Sizes, The Hong Kong Polytechnic University, Hong Kong, China (Invited), May 10, 2016

Artifact Evaluation, III Arnold Workshop: Reproducibility in Modeling and Code, American Association for the Advancement of Sciences (AAAS), Washington, DC (remote), February 15, 2016

Demonstration of OCCAM, Schloss Dagstuhl Perspectives Workshop on Artifact Evaluation for Publications (Dagstuhl), Warden, Germany, November 2, 2015

OCCAM Update: Open Curation for Computer Architecture Modeling, Modeling and Simulation for Systems and Applications (ModSim), Seattle, Washington, August 14, 2015

Artifact Evaluation: The Process, Mechanism and our Experience, Workshop on DL-Technology: Data, Software and Reproducibility, Association for Computing Machinery, New York City, New York (Invited), July 2, 2015

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OCCAM: Open Curation for Computer Architecture Modeling, ACM SIGPLAN and SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES), Portland, Oregon (Invited), June 19, 2015

OCCAM: Open Curation for Computer Architecture Modeling, Cornell University, Computer Systems Laboratory (ECE), Ithaca, New York (Invited), May 11, 2015

OCCAM: Open Curation for Computer Architecture Modeling, School of Computer Science and Engineering, University of New South Wales, Sydney, Australia (Invited), November 14, 2014

OCCAM: Open Curation for Computer Architecture Modeling, Department of Computer Science, University of Utah, Salt Lake City, Utah (Invited), October 24, 2014

HPCSoC Modeling and Simulation Implications, Workshop on System-on-a-Chip Design for HPC, Denver, Colorado (Invited), August 27, 2014

Creating an Open Exchange for HPCSoC, Workshop on System-on-a-Chip Design for HPC, Denver, Colorado (Invited), August 27, 2014

OCCAM: Open Curation for Computer Architecture Modeling (An Update), SST Workshop and Tutorial, Catonsville, Maryland (Invited), June 26, 2014

Introducing the OCCAM project, SIGPLAN TRUST 2014, 1st Workshop on Reproducible Research Methodologies and New Publication Models in Computer Engineering, Edinburgh, Scotland (Invited), June 12, 2014

OCCAM: Is there a future for open-access simulation and experimentation?, DOE ModSim Workshop, Seattle, Washington (Invited), September 19, 2013

OCCAM: Open Curation for Computer Architecture Modeling, Modeling, Simulation and Emulation Workshop (MSE), Catonsville, Maryland (Invited), July 23, 2013

OCCAM: Open Curation for Computer Architecture Modeling, HiPEAC Computing Systems Week, thematic session, Paris, France (Keynote), May 2, 2013

Surfing the Wave of Emerging Hybrid Main Memory Architectures, 16th Workshop on Interaction between Compilers and Computer Architecture (INTERACT), New Orleans, Louisiana (Keynote), February 25, 2012

Hybrid Main Memory Systems for Energy-Efficient Computing, Rambus, Inc., Santa Clara, California (talk and tutorial), January 12, 2012

Cyberinfrastructure for Computer Architecture Research and Development, Computer Architecture Simulation Framework, Birds of a Feather, Supercomping 2011, Seattle, Washington, November 15, 2011

Commercially Available Chip Multiprocessors for Research, CRA-W/CDC Workshop on Multicore Computer Architecture Research, Newport Beach, California, March 6, 2011

Seminar on Emerging Paradigms and Uses for Dynamic Binary Translation, Schloss Dagstuhl - Leibniz Center for Informatics, Warden, Germany, October 26-31, 2008

Integrated CPU and L2 Cache Frequency/Voltage Scaling using Supervised Learning, Schloss Dagstuhl Seminar on Power-Aware Computing, Warden, Germany, January 23, 2007

Continuous Compilation for Aggressive and Adaptive Code Transformation, Center for Embedded Systems, University of California, Irvine, CA, May 13, 2005

Continuous Compilation for Aggressive and Adaptive Code Transformation, Department of Computer Science, North Carolina State University, Raleigh, NC, May 4, 2005

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Continuous Compilation for Aggressive and Adaptive Code Transformation, Electrical and Computer Engineering and Computer Science, University of Rochester, Rochester, New York, March 31, 2005

Continuous Compilation for Aggressive and Adaptive Code Transformation, School of Electrical Engineering and Computer Science, Oregon State University, Corvallis, Oregon, February 17, 2005

Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation, Pennsylvania State University, State College, PA, November 11, 2004

Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation, COPPE – Systems Engineering and Computer Science Program, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil, July 1, 2004

Continuous Compilation: A New Approach to Aggressive and Adaptive Code Transformation, Instituto de Informatica, Federal University of Rio Grande do Sul, Porto Alegre, Brazil, June 29, 2004

Power-Aware Information Appliances, IBM Austin Center for Advanced Studies, Austin, Texas, February 2001

Reordering memory bus transactions for reduced power consumption, IBM Austin Research Lab, Systems Group, Austin, Texas, June 2000

Custom Counterflow Pipelines, Hewlett-Packard Inc., Performance Delivery Laboratory, Cupertino, California, March 1998

Application-Specific Counterflow Pipelines, Center for Computing Science, Institute for Defense Analysis, Bowie, Maryland, February 1998

Counterflow Pipeline Synthesis, Hewlett-Packard Inc., California Language Laboratory, Cupertino, California, August 1996

Other Activities (Invited)

ACM Invited 3rd Workshop for DL-Technology: Data, Software, & Reproducibility, Association for Computing Machinery, New York, New York, December 7, 2017

2017 Workshop on Reproducibility Taxonomies for Computing and Computational Science, Sponsored by NSF, Arlington, Virginia, July 25, 2017

ACM Invited 2nd Workshop for DL-Technology: Data, Software, & Reproducibility, Association for Computing Machinery, New York, New York, May 5, 2016

Workshop on the Future of Research Curation and Research Reproducibility, Sponsored by IEEE and NSF, Washington, DC, November 5-6, 2016

ACM Invited Workshop for DL-Technology: Data, Software, & Reproducibility, Association for Computing Machinery, New York, New York, July 2, 2015

HPCSoC Modeling and Simulation Implications, DOE/NSF/DoD Invited Visioning Workshop on System-on-a-Chip Design for HPC, Denver, Colorado, August 27, 2014

Creating an Open Exchange for HPCSoC, DOE/NSF/DoD Invited Visioning Workshop on System-on-a-Chip Design for HPC, Denver, Colorado, August 27, 2014

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Postdoctoral Fellows, Staff and Students

Ph.D. Theses Advised

Qi Yu, *Managing Heterogeneous Memory for GPGPUs*, University of Pittsburgh, visiting PhD student scholar, China Scholarship Council, October 2017–September 2019 (expected)

Qian Cheng, *Design of Hybrid Memory*, University of Pittsburgh, visiting PhD student scholar, China Scholarship Council, October 2016–September 2018 (expected)

Santiago Bock, *Quality of Service in Software-Managed Hybrid Main Memory*, University of Pittsburgh (Bruce Childers, Committee chair), graduated Fall 2017

Musfiq Rahman, *Continuous Online Memory Testing*, University of Pittsburgh (Bruce Childers, Committee chair), graduated December 2016, employed at Nvidia

Ryan Moore, *Dynamic Application Threading for Improved Performance*, University of Pittsburgh, received Andrew Mellon Predoctoral Fellowship in 2012/2013 (Bruce Childers, Committee chair), graduated December 2013, employed at IBM, Pittsburgh, Pennsylvania

Jon Misurda, *Efficient Branch and Node Testing*, University of Pittsburgh (Bruce Childers, Committee chair), graduated December 2011, employed at University of Pittsburgh as teaching faculty, Pittsburgh, Pennsylvania

José A. Baiocchi, *Dynamic Binary Translation for Embedded Systems with Scratchpad Memory*, University of Pittsburgh (Bruce Childers, Committee chair), graduated December 2011, employed at Google

Yuqiang Huang, *Checking Static and Dynamic Optimizations*, University of Pittsburgh (Bruce Childers, Committee chair), admitted to candidacy, writing dissertation, employed at MicroStrategy, Tyson's Corner, Virginia

Hyunjin Lee, *Fault and Yield Aware On-Chip Memory Design and Management*, University of Pittsburgh (Bruce Childers, Committee co-chair and Sangyeun Cho, Committee co-chair), graduated August 2011, employed at Intel Labs, Microarchitecture Research Lab, as Software Engineer, Santa Clara, California

Alexandre Peixoto Ferreira, *The Design of a High Capacity and Energy Efficient Phase Change Main Memory*, University of Pittsburgh (Daniel Mossé, Committee chair and Bruce Childers, Committee co-chair), graduated April 2011, employed at IBM Research Austin as Post-Doctoral Researcher, Austin, Texas

Naveen Kumar, *Debugging Adaptive Code*, University of Pittsburgh (Bruce Childers, Committee co-chair and Mary Lou Soffa, Committee co-chair), received Andrew Mellon Predoctoral Fellowship in 2005/2006, graduated May 2008, employed at Google

Min Zhao, *Profit-Driven Optimization*, University of Pittsburgh (Bruce Childers, Committee co-chair and Mary Lou Soffa, Committee co-chair), received Andrew Mellon Predoctoral Fellowship in 2003/2004, graduated August 2006, employed at Hewlett-Packard as Senior Software Engineer, Cupertino, California

Postdoctoral Fellow and Staff

Luis Oliveira, *EASE/OCCAM Improving Research Accountability through Artifact Evaluation*, University of Pittsburgh, postdoctoral fellow (co-advised with Daniel Mosse'), April 2016–present

David Wilkinson, *OCCAM Open Curation for Computer Architecture Modeling*, University of Pittsburgh, professional staff (Systems Programmer III), August 2014–present

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Other Ph.D. Theses Advised

I worked closely with and advised these students in group research.

Yu Du, *Computer Architecture Techniques for Large-Capacity Hybrid Memory*, University of Pittsburgh (Rami Melhem, Committee chair), graduated Spring 2015

Miao Zhao, *Shared Resource Management in Multi-core Systems with Hybrid Main Memory*, University of Pittsburgh (Rami Melhem, Committee chair), graduated August 2015

Nevine AbouGhazaleh, *Power Management Techniques for Conserving Energy in Multiple System Components*, University of Pittsburgh (Rami Melhem, Committee co-chair, and Daniel Mossé, Committee co-chair), graduated May 2008 (acted as a mentor/advisor throughout dissertation in the PARTS group), employed at Intel Microarchitecture Research Labs, Hillsboro, Oregon.

Mauricio Lima Pilla, *Reuse through Speculation on Traces*, Computer Science Institute, Brazil (Pilippe O. A. Navauv, advisor, and Felipe M.G. Franca, co-advisor), visited the University of Pittsburgh in 2002-2003, graduated June 2004 (acted as a mentor/advisor at Pitt and during dissertation), employed at Universidade Federal de Pelotas, Rio Grande do Sul, Brazil as Assistant Professor

M.S. Projects

Chris Corsi, *Clustering to Understand the Impact of Artifact Evaluation*, University of Pittsburgh (co-advised with Panos Chrysanthis), April 2018

John Johnson, *CLEVERCUBE: Smart Memories Securing Architectures*, University of Pittsburgh, April 2018

Chuck Smith, *Analyzing Access Contention in the Hybrid Memory Cube*, University of Pittsburgh, April 2018

Anuradha Kulkarni, *The Effect of Artifact Evaluation on Scholarly Impact*, University of Pittsburgh (co-advised with Panos Chrysanthis), April 2017

Chelsea Mafra, *Continuous Query Processing in Hybrid Main Memory*, University of Pittsburgh, April 2015

Brian Dicks, *Simulation in the OCCAM Framework*, University of Pittsburgh, April 2014

José Baiocchi, *Dynamic Translation for MIPS Processor Embedded Systems*, University of Pittsburgh, August 2007

Perry Rajnovic, *Instruction Set Support for Fast Indirect Branch Translation*, University of Pittsburgh, August 2007

Brian Smyth, *A Graphical User Interface for Structural Testing in Eclipse*, University of Pittsburgh, August 2005

Jonathan Misurda, *Demand-Driven Structural Software Testing with Dynamic Instrumentation*, University of Pittsburgh, April 2005

Jim Clause, *Demand-Driven Def-Use Testing*, University of Pittsburgh, Ph.D. student at Georgia Tech, April 2005

Shukang Zhou, *Code Buffer Management in Distributed Virtual Execution Environments*, University of Pittsburgh, December 2004

Juliya Litman, *An Integrated Code Coverage System for Software Test and Analysis*, University of Pittsburgh, April 2004, Microsoft

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Haidong Xia, *Trace-Level Value Reuse*, University of Pittsburgh (co-advised with Mary Lou Soffa), December 2003

Joe Slember, *Program Profiling Primitives*, University of Pittsburgh (co-advised with Mary Lou Soffa), Ph.D. student at Carnegie Mellon University, December 2003

Sridhar Daita, *An API for Program Instrumentation in a Software Dynamic Translator*, University of Pittsburgh, December 2003

Nancy Miller, *Understanding and Controlling Static Leakage of Processor Functional Units*, University of Pittsburgh, April 2003, Carnegie Mellon University

Naveen Kumar, *Software Dynamic Translation on the MIPS/Irix Platform*, University of Pittsburgh, Ph.D. student at University of Pittsburgh, May 2002

Madhuri Vemulapalli, *Branch Coverage Analysis for Java Programs*, University of Pittsburgh (co-advised with Mary Lou Soffa), May 2001

Hongliang Tang, *Adapting Processor Supply Voltage to Instruction-Level Parallelism*, University of Pittsburgh, December 2001

Undergraduate Senior Projects and Independent Study

John Johnson, *Research Experience for Undergraduates*, University of Pittsburgh, Computer Science undergraduate, Spring 2015, Fall 2015, Spring 2016, Spring 2017

Seth Stayer, *Research Experience for Undergraduates*, University of Pittsburgh (co-advised with Panos Chrysanthis), Computer Science undergraduate, Spring 2017

Jordan McAleer, *Senior capstone experience*, University of Pittsburgh, Computer Science undergraduate, Spring 2015

Matthew Monaco, *Senior capstone experience*, University of Pittsburgh, Computer Science undergraduate, Summer/Fall 2011

Christian DeLozier, *Graphical User Interface for Memory Fault Monitoring*, University of Pittsburgh, Computer Science undergraduate, senior capstone experience and independent study Fall 2009 and Spring 2010 (graduated with a B.S., 2010)

Jason Mars, *Overhead Reduction for Indirect Branch Handling in Dynamically Translated Code*, University of Pittsburgh, Computer Science undergraduate, Research Experience for Undergraduates (graduated with a B.S., 2005)

Stacey Shogan, *Compact Binaries with Code Compression in a Software Dynamic Translator*, University of Pittsburgh, Computer Engineering senior project (graduated with a B.S., April 2004)

Lidiya Ber, *SoftTest: A Framework for Software Testing of Java Programs*, University of Pittsburgh, CS undergraduate, independent study (graduated April 2004, co-advised with Mary Lou Soffa)

Kevin Cammarata, *SoftTest: A Framework for Software Testing of Java Programs*, University of Pittsburgh, CS undergraduate, independent study (graduated April 2003, co-advised with Mary Lou Soffa)

Joe Atzinger, *Power Measurement*, University of Pittsburgh, Computer Engineering independent study, 2002

Craig Williford, *Cache Line Reordering for Reduced Power Consumption*, University of Pittsburgh, Computer Engineering senior project (graduated May 2002)

Josh Mehl, *Student Co-op Internship*, University of Pittsburgh, Computer Science Co-op, Summer 2002

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Chris Scott, *Power Measurement*, University of Pittsburgh, Computer Engineering independent study, 2001

Ph.D. Comprehensive and Defense Committees

Lei Jiang, University of Pittsburgh (ECE), comprehensive 2011 (scheduled)

Juyoung Jung, University of Pittsburgh, passed comprehensive 2011

Weijia Li, University of Pittsburgh, expected 2011

Ping Zhou, University of Pittsburgh (ECE), expected 2011

Luke Dalessandro, University of Rochester (external member), expected 2011

Michael Moeng, University of Pittsburgh, passed comprehensive 2009

Jin Lei, University of Pittsburgh, graduated August 2010

Mohammad Hammoud, University of Pittsburgh, graduated June 2010

Ruibin Xu, University of Pittsburgh, graduated January 2010

Jiang Zheng, University of Pittsburgh, graduated September 2008

Gregory Kapfhammer, University of Pittsburgh, graduated April 2007

Takashi Okumura, University of Pittsburgh, graduated April 2007

Cosmin Rusu, University of Pittsburgh, graduated August 2006

Jason Bakos, University of Pittsburgh, graduated April 2005

Dakai Zhu, University of Pittsburgh, graduated December 2004

Leo Selavo, University of Pittsburgh, graduated August 2004

Mauricio Pilla, Federal University of Rio Grande do Sul, Computer Science Institute, Brazil (external committee member), graduated June 2004

Tarun Nakra, University of Pittsburgh, graduated April 2000

Tutorials

- ACSRP Bruce Childers, Luis Oliveira, David Wilkinson, “Using OCCAM with SST”, *Tutorial given for the Advanced Computing Systems Research Program, Laboratory for the Physical Sciences, Catonsville, Maryland, July 2018*
- ACSRP Bruce Childers, Luis Oliveira, David Wilkinson, “Open Curation for Computer Architecture”, *Tutorial given for the Advanced Computing Systems Research Program, Laboratory for the Physical Sciences, Catonsville, Maryland, July 2017*
- ISCA Bruce Childers, Arun Rodrigues, Branden Moore, Noel Wheeler, Thomas Salter, and Marcel Fallet, “Solving and Sharing the Puzzle: Modeling and Simulation of Computer Architectures with SST and OCCAM”, *Int’l. Symp. on Computer Architecture, Toronto, Canada, June 2017*
- SC16 Bruce Childers, Arun Rodrigues, Branden Moore, Richard Murphy, Noel Wheeler, Thomas Salter, and Marcel Fallet, “Solving and Sharing the Puzzle: Modeling and Simulation of Computer Architectures with SST and OCCAM”, *The Int’l. Conf. for High Performance Computing, Networking, Storage and Analysis, Salt Lake City, Utah, November 2016*
- ISCA Bruce R. Childers, Daniel Mossé, and David Wilkinson, “OCCAM: Open Curation for Computer Architecture Modeling”, *Int’l. Symp. on Computer Architecture, Portland, Oregon, June 2015*

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- HPCA Bruce R. Childers, Daniel Mossé, and David Wilkinson, “OCCAM: Open Curation for Computer Architecture Modeling”, *Int’l. Conf. on High-Performance Computer Architecture*, San Francisco, California, February 2015
- HiPEAC Bruce R. Childers and Jack W. Davidson, “Techniques and Uses of Software Dynamic Translation in Embedded Systems”, *Int’l. Conf. on High-Performance Embedded Architectures and Compilers*, Paris, France, January 2012
- MICRO Bruce R. Childers, Alexandre P. Ferreira, and Daniel Mossé, “Emerging Architectures for DRAM+PCM Main Memory Systems”, *Int’l. Symp. on Microarchitecture*, Porto Alegre, Brazil, December 2011
- MICRO Bruce R. Childers and Jack W. Davidson, “Building Efficient Software Dynamic Translators”, *38th Annual IEEE/ACM Int’l. Symp. on Microarchitecture*, Barcelona, Spain, November 2005
- CGO Bruce R. Childers and Jack W. Davidson, “Software Dynamic Translation: Challenges, Approaches, and Applications”, *ACM/IEEE Int’l. Symp. on Code Generation and Optimization*, San Jose, California, March 2005

Software Systems (Deployed/Released)

- OCCAM OCCAM is a digital curator for modeling and simulation. It provides a wide set of capabilities required by an open ecosystem of models and simulation tools. It allows flexibly combining data, software and other tools into workflows to conduct transparent experiments, which can be shared, modified and run online. A demonstration of the system is available: <https://occam.cs.pitt.edu>. David Wilkinson is the lead software developer.
- StrataX A software dynamic translator and executive to support embedded systems with tight constraints on memory and performance. Developed in collaboration with José Baiocchi (as part of his Ph.D. thesis) at the University of Pittsburgh. Jason Hiser and Jack Davidson at the University of Virginia also contributed. This system is the main focus of the tutorial to be given at the HiPEAC conference in Paris, France, January 2012.
- HM-Sim A framework for modeling, simulating and analyzing different computer main memory organizations, including organizations that use a combination of DRAM and phase-change memory. Developed in collaboration with Alexandre Ferreira (as part of his Ph.D. thesis), Miao Zhou (Ph.D. student), Rami Melhem and Daniel Mosse’. This simulator is the principal focus of the tutorial to be given at the MICRO-44 conference in Porte Alegre, Brazil, December 2011.
- Strata A retargetable and reconfigurable framework for software dynamic translation. Co-developed with numerous graduate and undergraduate students and faculty, including Jose Biacchi, Naveen Kumar, Jason Mars, Ryan Moore and Stacey Shogan (students at University of Pittsburgh); Jason Hiser, Kevin Scott, and Dan Williams (students at University of Virginia); and, Jack Davidson and Mary Lou Soffa (faculty at University of Virginia). Targeted to ARM, MIPS, PowerPC, and PISA instruction sets and embedded system resource management at Pitt; targeted to SPARC and x86 instruction sets and security applications at the University of Virginia. This system was the primary focus of the tutorials given at the MICRO-38 and CGO 2005 conferences.

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TDB A source-level debugger for dynamically translated programs. Implemented with the gdb debugger and the Strata software dynamic translator for the SPARC instruction set architecture. Developed in collaboration with Naveen Kumar at the University of Pittsburgh (as part of his Ph.D. thesis) and Mary Lou Soffa at the University of Virginia. This system was described and demonstrated at the CGO 2005 conference tutorial.

Teaching

Teaching Awards

Spring 2015 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2011 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2009 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2007 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2001 *CS 3410 Advanced Topics in Computer Architecture*
Spring 2000 *CS 3410 Advanced Topics in Computer Architecture*

Undergraduate Courses Taught at University of Pittsburgh

Spring 2017 *CS 447 Computer Organization and Assembly Language Programming*
Spring 2016 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2014 *CS 447 Computer Organization and Assembly Language Programming*
Spring 2014 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2012 *CS 447 Computer Organization and Assembly Language Programming*
Spring 2012 *CS 447 Computer Organization and Assembly Language Programming*
Spring 2011 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2010 *CS 447 Computer Organization and Assembly Language Programming*
Spring 2009 *CS 447 Computer Organization and Assembly Language Programming*
Fall 2008 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2008 *CS 1590 Social Implications of Computing*
Fall 2006 *CS 1680 Program Design and Implementation*
Fall 2006 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2006 *CS/COE 1541 Introduction to Computer Architecture*
Fall 2005 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2005 *CS/COE 1541 Introduction to Computer Architecture*
Fall 2004 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2004 *CS/COE 1520 Programming Languages for Web Applications*
Fall 2003 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2003 *CS/COE 1520 Programming Languages for Web Applications*
Spring 2003 *CS/COE 1541 Introduction to Computer Architecture*
Spring 2002 *CS/COE 1541 Introduction to Computer Architecture*
Fall 2000 *CS/COE 1541 Introduction to Computer Architecture*

Graduate Courses Taught at University of Pittsburgh

Fall 2017 *CS 2410 Graduate Computer Architecture*
Fall 2016 *CS 2410 Graduate Computer Architecture*

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- Spring 2015 *CS 3410 Advanced Topics in Computer Architecture*
- Spring 2010 *CS 3210 Advanced Topics in Programming Languages*
- Fall 2008 *CS 2410 Graduate Computer Architecture*
- Spring 2006 *CS 3210 Advanced Topics in Programming Languages*
- Fall 2004 *CS 2410 Computer Architecture*
- Spring 2004 *CS 3410 Advanced Topics in Computer Architecture*
- Fall 2002 *CS 2410 Computer Architecture*
- Fall 2001 *CS 2410 Computer Architecture*

Professional Preparation Courses Developed and Taught

- May 2002 *Pittsburgh Digital Greenhouse System on a Chip, System Level Design*, taught at the University of Pittsburgh, Pittsburgh, PA (with Don Chiarulli)
- January 2002 *Pittsburgh Digital Greenhouse System on a Chip, System Level Design*, taught at the University of Pittsburgh, Pittsburgh, PA (with Don Chiarulli)

University Service

- 2018 *Trained mentor*, National Research Mentoring Network (training at Pitt in May 2018)
- 2014–2015 *Member*, Faculty Recruiting committee, Computer Science Department
- 2013–present *Member*, Graduate Admission and Financial Aid committee, Computer Science Department
- 2011 *Reviewer*, Central Research Development Fund, Office of Research
- 2007 *Member*, Hewlett Int'l. Grant Program Selection Committee, University Center for International Studies
- 2006–2008 *Member*, Faculty Recruiting Committee
- 2006–2007 *Committee member*, Department Vision Task Force
- 2005–2006 *Member*, The Space Committee
- 2004–2005 *Member*, Promotions, Computer Engineering graduate program
- 2003–2004 *Member*, Computer Science Department Annual Research Competition Committee
- 2003–2005 *Member*, Graduate Admission and Financial Aid Committee
- 2000–2003 *Department Web Master*, Outreach Committee
- 2001–2002 *Member*, Computer Science Department Annual Research Competition Committee

Professional Service

Editorship/Editorial Board

- 2010–present *Member of the Editorial Advisory Board*, Computer Languages, Systems and Structures Journal, Elsevier
- March 2007 *Guest Co-Editor*, Computer Languages, Systems and Structures, Special Issue on Embedded Systems: Compiler-Architecture Interaction, Elsevier
- 2006 *Guest Editorial Board*, Int'l. Journal on Embedded Systems, Special Issue on Power-Aware Real-Time Computing, Elsevier
- August 2001 *Guest Co-Editor*, IEEE Transactions on Computers, Special Issue on Parallel Architectures and Compilation Techniques

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Leadership Role in Conferences and International Meetings

- 2018 *Track program co-chair*, Computer Systems Architecture track, Int'l. Conf. on Computer Design, Orlando, Florida
- 2016 *Area program chair*, ESS3 area, ACM Design Automation Conf., Austin, Texas
- 2015 *Area program chair*, ESS3 area, ACM Design Automation Conf., San Francisco, California
- 2015 *Lead organizer*, Schloss Dagstuhl Perspectives Workshop on Artifact Evaluation for Publications, Warden, Germany
- 2012–2015 *Steering committee chairperson*, ACM SIGPLAN and SIGBED Conf. on Languages, Compilers and Tools for Embedded Systems
- 2014–present *Steering committee member*, Int'l. Conf. on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools
- 2014 *Co-organizer*, Supercomputing Bird of a Feather Defining Interfaces for Interoperable Simulation and Modeling Tools, New Orleans, Louisiana
- 2014 *Program chair*, Int'l. Conf. on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools, Cracow, Poland
- 2014 *Co-organizer*, TRUST: Int'l. Workshop on Reproducible Research Methodologies and new Publication Models (held at PLDI'14), Edinburgh, Scotland
- 2014 *Co-organizer*, REPRODUCE: Workshop on Reproducible Research Methodologies, Orlando, Florida
- 2013 *Co-organizer*, Supercomputing Bird of a Feather Architecture and Systems Simulators, Denver, Colorado
- 2010–2012 *Steering committee*, ACM SIGPLAN and SIGBED Conf. on Languages, Compilers and Tools for Embedded Systems
- 2012 *Organizer*, NSF Workshop on Community Supported Computer Architecture Design and Evaluation Framework, <http://csa.cs.pitt.edu>, Arlington, Virginia
- 2012 *Co-organizer*, Supercomputing Bird of a Feather Architecture and Systems Simulators, Salt Lake City, Utah
- 2010 *Program chair*, ACM SIGPLAN and SIGBED Conf. on Languages, Compilers and Tools for Embedded Systems, Stockholm, Sweden
- 2010 *Steering committee*, 14th Annual Workshop on the Interaction between Compilers and Computer Architecture, Pittsburgh, Pennsylvania
- 2008 *General chair*, 12th Annual Workshop on the Interaction between Compilers and Computer Architecture, Salt Lake City, Utah
- 2008 *Lead organizer*, Schloss Dagstuhl Seminar on Emerging Uses and Paradigms for Binary Translation, Warden, Germany
- 2007 *Program committee chair*, 11th Annual Workshop on the Interaction between Compilers and Computer Architecture, Phoenix, Arizona
- 2003 *Co-organizer*, Workshop on Constraint-Aware Embedded Systems, Cancun, Mexico
- 2003 *Co-organizer*, Workshop on Exploring the Trace Space for Dynamic Optimization Techniques, San Francisco, California
- 2001 *Co-organizer*, IEEE Workshop on Power Management for Real-Time and Embedded Systems, Taipei, Taiwan ROC

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Organizing Committees

- 2019 *Co-organizer*, Artifact Evaluation for Int'l. Symp. on Code Generation and Optimization
- 2015–present *Organizing committee*, DOE/DoD/NSF Workshop on Modeling and Simulation of Systems and Applications
- 2017 *Co-organizer*, Artifact Evaluation for Int'l. Conf. on Parallel Compilation and Architecture Techniques
- 2016 *Co-organizer*, Artifact Evaluation for Int'l. Symp. on Code Generation and Optimization
- 2016 *Co-organizer*, Artifact Evaluation for ACM SIGPLAN Symp. on Principles and Practice of Parallel Programming
- 2015 *Co-organizer*, Artifact Evaluation for Int'l. Symp. on Code Generation and Optimization
- 2015 *Co-organizer*, Artifact Evaluation for ACM SIGPLAN Symp. on Principles and Practice of Parallel Programming
- 2013 *Tutorial Chair*, ACM Symp. on Code Generation and Optimization
- 2013 *Student travel grants*, Int'l. Conf. on Parallel Architectures and Compilation Techniques, Edinburgh, Scotland
- 2006 *Americas Publication Chair*, ACM SIGPLAN and SIGBED Conf. on Languages, Compilers and Tools for Embedded Systems
- 2005 *Student poster chair*, ACM SIGPLAN and SIGBED Conf. on Languages, Compilers, and Tools for Embedded Systems
- 2003 *Publications chair*, Int'l. Conf. on Parallel Architectures and Compilation Techniques, New Orleans, Louisiana
- 2002 *Local Arrangements Co-chair*, Int'l. Conf. on Parallel Architectures and Compilation Techniques, Charlottesville, Virginia
- 2002 *Co-organizer Work in Progress*, Int'l. Conf. on High-Performance Computer Architecture, Boston, Massachusetts
- 2001 *Co-organizer Work in Progress*, Int'l. Conf. on Parallel Architectures and Compilation Techniques, Barcelona, Spain
- 2000 *Program Web Master*, Int'l. Conf. on Parallel Architectures and Compilation Techniques, Philadelphia, Pennsylvania

Program and Other Committees

- 2016–present ACM SIG Governing Board Replication Taskforce
- 2015–present ACM Task Force on Data, Software and Replicability in Publication
- 2018 The 7th IEEE Non-Volatile Memory Systems and Applications Symp.
- 2017 The 6th IEEE Non-Volatile Memory Systems and Applications Symp.
- 2017 Int'l. Conf. on Supercomputing
- 2016 Int'l. Symp. on Memory Systems
- 2016 Int'l. Conf. on Supercomputing
- 2016 Int'l. Conf. on Parallel Processing
- 2016 Design Automation Conf.
- 2016 6th Annual Non-Volatile Memories Workshop

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2015 IEEE Int'l. Conf. on Parallel and Distributed Systems
 2015 IEEE Int'l. Symp. on Workload Characterization
 2015 Design Automation Conf.
 2015 5th Annual Non-Volatile Memories Workshop
 2015 IEEE Int'l. Parallel and Distributed Processing Symp.
 2015 5th Int'l. Workshop on Adaptive Self-tuning Computing Systems
 2015 Int'l. Conf. on the Principles and Practice of Programming in Java
 2014 Design Automation Conf.
 2014 Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
 2014 4th Int'l. Workshop on Adaptive Self-tuning Computing Systems
 2014 Int'l. Conf. on High Performance Embedded Architectures and Compilers
 2013 Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
 2013 4th Annual Non-Volatile Memories Workshop
 2013 IEEE Int'l. Symp. on Performance Analysis of Systems and Software
 2013 Int'l. Conf. on High Performance Embedded Architectures and Compilers
 2012 Power, Energy and Temperature Aware Real-time Systems
 2012 Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
 2012 Int'l. Conf. on the Principles and Practice of Programming in Java
 2011 IEEE Int'l. Symp. on Workload Characterization
 2011 Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
 2011 Int'l. Conf. on the Principles and Practice of Programming in Java
 2010 IEEE Int'l. Parallel and Distributed Processing Symp., computer architecture track
 2010 Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
 2010 Int'l. Conf. on the Principles and Practice of Programming in Java
 2009 Parallel Architectures and Compilation Techniques
 2009 ACM SIGPLAN and SIGBED Conf. on Languages, Compilers, and Tools for Embedded Systems
 2009 ACM Int'l. Conf. on the Principles and Practice of Programming in Java
 2009 IEEE Int'l. Conf. on Embedded Software and Systems
 2009 Testing: Academic and Industrial Conf. - Practice and Research Techniques
 2009 6th IEEE Int'l. Conf. on Embedded Software and Systems
 2008 ACM Symp. on Code Generation and Optimization
 2007 Virtual Machines and Intermediate Languages for Emerging Modularization Mechanisms
 2007 Workshop on Integrating System Environments into Software Testing
 2007 Int'l. Conf. on High Performance Embedded Architectures and Compilers
 2006 10th IEEE Workshop on the Interaction between Compilers and Computer Architecture
 2006 12th IEEE Real-Time and Embedded Technology and Applications Symp.
 2006 Int'l. Conf. on Autonomic Computing
 2005 Second Int'l. Workshop on Power-Aware Real-Time Computing

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- 2005 2nd Workshop on High-Performance Fault-Adaptive Large-Scale Embedded Real-Time Systems
- 2005 Int'l. Conf. on Autonomic Computing
- 2005 11th IEEE Real-Time and Embedded Technology and Applications Symp.
- 2004 First Int'l. Workshop on Power-Aware Real-Time Computing
- 2004 ACM SIGPLAN and SIGBED Conf. on Languages, Compilers, and Tools for Embedded Systems
- 2003 Workshop on Compilers and Operating Systems for Low Power
- 2002 IEEE Workshop on Large Scale Real-Time and Embedded Systems
- 2001 Workshop on Compilers and Operating Systems for Low Power
- 2000 Int'l. Conf. on Parallel Architectures and Compilation Techniques

Funding Panel Reviewing

Specific panel names and dates removed for confidentiality.

CISE CNS, CSR, CCF, ITR, CAREER, CPA, SBIR and others (multiple times on some panels), National Science Foundation

Reviewer, Science Foundation Ireland

Reviewer, Swedish Research Council

Journal, Conference and Book Reviewing

Reviewed multiple times for most journals and conferences.

ACM Transactions on Design Automation of Electronic Systems

ACM Transactions on Computer Architecture and Compiler Optimization

ACM Transactions on Embedded Systems

ACM Transactions on Software Engineering and Management

IEEE Transactions on Computers

IEEE Transactions on Software Engineering

IEEE Transactions on Parallel and Distributed Systems

IEEE Computer

IEEE Micro

IEE Proceedings of Computers and Digital Techniques

Journal of Microsystems and Microprocessors

The Computer Journal, Oxford Journals

Int'l. Symp. on High-Performance Computer Architecture

Conf. on Programming Language Design and Implementation

Conf. on Principles of Programming Languages

Architectural Support for Programming Languages and Operating Systems

Int'l. Symp. on Microarchitecture

Int'l. Conf. on Parallel Compilation and Architecture Techniques

Int'l. Conf. on Virtual Execution Environments

Int'l. Symp. on Performance Analysis of Systems and Software

Int'l. Symp. on Code Generation and Optimization

Real-Time and Embedded Technology and Applications Symp.

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Int'l. Conf. on Compilers, Architecture and Synthesis for Embedded Systems
Int'l. Conf. on Embedded Software
Asia South Pacific Design Automation Conf.
Int'l. Conf. on High Performance Embedded Architectures and Compilers
Design Automation and Test in Europe
Design Automation Conf.
Kluwer Academic Publisher
John Wiley & Sons
Computer Architecture Letters

Photo at top is attributed to Intel Corporation, 4004 microprocessor historical material.