

Michelle Mills Strout
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Research Interests

Programming models for domain scientists and performance programmers. Techniques for making such programming models result in efficient implementations including compile-time and run-time transformations for data locality and parallelization. Other research interests include combined static and dynamic program analysis, interaction of compilers with modern architectures, domain-specific compilation, scientific computing, and software engineering.

Education

Doctor of Philosophy degree in Computer Science University of California, San Diego Advisors: Dr. Larry Carter and Dr. Jeanne Ferrante	July 2003
Master of Science degree in Computer Science University of California, San Diego	December 1999
Bachelor of Science degree in Computer Science University of California, San Diego Honors: Summa Cum Laude	June 1997

Awards and Honors

DOE Early Career Award, March 2010 through March 2015
NSF CAREER Award, March 2008 through March 2013
AT&T Labs Grant and Fellowship, 1997-2003
National Science Foundation Fellowship, 1997-2000

Professional Experience

Full Professor at University of Arizona	August 2015 - present
Associate Professor at Colorado State University	August 2011 - August 2015
Assistant Professor at Colorado State University	August 2005 - 2011
Research included the automatic generation of run-time reordering transformations (i.e. inspector/executor strategies) and programming models that enable the separation of algorithms from implementation details.	
Enrico Fermi Postdoctoral Scholar at Argonne National Laboratory	September 2003 - July 2005
Research Associate at the University of Chicago (joint appointment)	
At Argonne I researched domain-specific program analysis for automatic differentiation.	
Research Assistant at University of California, San Diego	September 1997 - June 2003
With my advisors Dr. Jeanne Ferrante and Dr. Larry Carter, I worked on the Hierarchical Tiling project and the Sparse Tiling project.	
Summer Intern at AT&T Labs Research	Summer 1997
I worked with Dr. Ken Lyons to implement virtual shared memory for PCs running Windows NT with a Myrinet interconnect.	
Senior Coder at University of California, San Diego	October 1994 - April 1996
Systems administration, I created and maintained user resources and assisted users with various problems.	

Teaching Experience

Professor at University of Arizona

Topics in Programming Languages, CS620 Spring 2016

A graduate-level seminar course where students presented numerous parallel programming models and then worked with scientists at UA to port existing codes to parallel programming languages and compare performance and programmability across languages.

Assistant and Associate Professor at Colorado State University

Foundations of Fine-Grain Parallelism, CS560 Spring 2012

A graduate-level course that teaches performance programming, program optimization, and loop transformation theory including the polyhedral model.

Undergraduate Compilers, CS453 Spring 2007-2011, 2013, 2015

Updated this course so that student develop a compiler incrementally, with each deliverable for the compiler project involving code generation. The students develop a compiler that translates a subset of Java called MeggyJava to AVR assembly that can then be linked into an executable for the Meggy Jr device.

Computer Organization, CS270 Fall 2008, Fall 2012

Updated this course in collaboration with Wim Bohm so that the assignments were more substantial and include more opportunities for students to work with the C programming language. In addition, the students did seven graded labs during recitation sections in the new version of the course.

Topics in Programming Language Design and Implementation, CS653 Spring 2006-2008, Fall 2010-2011

Developed a graduate seminar course where students learn how to read and present papers as well as how to do a research project. Topics vary based on current research activities.

Graduate Compilers, CS553 Fall 2005, 2006, 2007, 2009, 2015

Developed a graduate-level compilers course that teaches garbage collection, data-flow analysis, program optimization, and loop transformation theory including the polyhedral model.

Co-Instructor at University of Chicago

Spring Quarter 2004

Graduate Computer Architecture, CS32200

Prepared half the lectures, developed homeworks that involved using computer architecture research tools such as SimpleScalar, and guided students through a quarter long research project or survey paper.

Volunteer Instructor for Upward Bound at University of California, San Diego

January 2003

Developed a program that demos convolution and then used it to teach a number of two hour sessions to high school students involved in upward bound.

Instructor at University of California, San Diego

Summer 2001

Computer Organization and Systems Programming, CSE30, 4 quarter credit hours

Prepared 4 lectures per week, developed 3 assembly language programming assignments, organized grading done by teaching assistants, wrote quizzes, midterm, and final exam.

Volunteer High School Instructor at University City High School

January 2000 - June 2000

Web Programming

Designed curriculum, coordinated with 2 other computer science students, lectured, and helped students in the lab. The class introduced students to HTML, cgi-programming, MySQL, Java, etc.

Teaching Assistant at University of California, San Diego

Winter 1999

Compiler Construction II, CSE131B, 4 quarter credit hours

Led sections, organized class project, and helped students in the lab.

Teaching Assistant at University of California, San Diego

Summer 1998

Design and Analysis of Algorithms, CSE101, 4 quarter credit hours

Teaching Assistant at University of California, San Diego

Summer 1995

Computer Organization and Systems Programming, CSE30, 4 quarter credit hours

Teaching Assistant at University of Toledo

Spring 1993

Problem Solving course for Engineering students

Masters Students Graduated

Andrew Stone, 2009
Alan LaMielle, 2010
Stephanie Dinkins, February 2012

Ph.D. Students Graduated

Christopher Wilcox, Spring 2012
Andrew Stone, Summer 2013
Christopher Krieger, Summer 2013

Grants and Research Funding

NSF PI, “SHF: Small: The Loop Chain Abstraction for Balancing Locality and Parallelism,” 8/1/2014 to 7/31/2017, \$499,954.

NSF PI, “The 24th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2011),” 9/1/2011 to 2/31/2012, \$2,500.

NSF Co-PI, “CI-P: Cyber-Infrastructure for the Cloud-Climate Community,” lead PI David Randall, 2/1/2011 to 1/31/2012, \$96,893.

NSF Significant Contributor, “Inverse Problem for Estimating Structure of Biological Macromolecules from SAXS,” lead PI Jay Breidt, Fall 2010 through Summer 2012, \$1.1 million.

DOE Principle Investigator, “DOE Early Career: Separating Algorithm and Implementation via Programming Model Injection (SAIMI)”, Spring 2010 through Spring 2015, \$750,000.

DOE Co-PI, “CACHE Institute: Algorithms and Software for Communication Avoidance and Communication Hiding, CACH at the Exascale”, Spring 2010 through Spring 2013. A collaboration between Lawrence Berkeley Labs (Erich Strohmaier), Berkeley (James Demmel), Argonne National Laboratory (Paul Hovland), and Colorado State University (Michelle Mills Strout), \$166,095 to Colorado State University.

NSF Principle Investigator, “CAREER: Parallelization using Inspector/Executor Strategies (PIES)”, NSF Faculty Early Career Development (CAREER), CCF-0746693, February 2008 through January 2013, \$397,235.

NSF Principle Investigator, “REU for CAREER: Parallelization using Inspector/Executor Strategies (PIES)”, NSF Faculty Early Career Development (CAREER), February 2008 through January 2013, \$11,891.00.

DOE Co-PI, “SciDAC Institute: Combinatorial Scientific Computing and Petascale Simulations (CSCAPES)”, January 2007 through December 2011, \$132,000 to Colorado State University, PI: Alex Pothen at Old Dominion University (ODU), Co-PIs: Florin Dobrian and Assefaw Gebremedhin at ODU, Erik Boman, Bruce Hendrickson, and Karen Devine at Sandia National Laboratory, Paul Hovland, Boyana Norris, and Jean Utke at Argonne National Laboratory, and Umit Catalyurek at Ohio State University.

DOE Principle Investigator with Co-PI Paul Hovland at Argonne National Laboratory, “Collaborative Research: Representation-Independent Compiler Technology for Domain-Specific Analysis with the Open-Analysis Toolkit”, DOE DE-FG02-06ER25724, March 2006 through February 2010, \$213,281 at Colorado State University.

Student Grants and Awards

Advisor, Ian Bertolacci received a scholarship to attend the 2016 ACM SIGPLAN Programming Languages Mentoring Workshop at the Conference on Programming Language and Implementation (PLMW@PLDI 2016), June 2016.

Advisor, Anthony Encinas won honorable mention in the Analytical Research category at the Honors First Year Project showcase, April 2016.

Advisor, Ian Bertolacci won 3rd place in the SC Undergraduate Student Research Competition, November 2014.

Advisor, Ian Bertolacci won 1st place in the Undergraduate Poster Competition at Rocky Mountain Celebration of Women in Computing (RMCWiC), October 2014.

Advisor, Samantha Wood won 1st place in the PLDI Undergraduate Student Research Competition, June 2011.

DREU Mentor, Distributed Research Experiences for Undergraduates summer research (sponsored by CRA-W, funded by NSF or DOE grants), \$6000 to each student for 10 weeks of research under my supervision, Summer 2007 (2 students), Summer 2010 (2 students), Summer 2011 (1 student).

Advisor, Women in Natural Sciences (WINS) 2008 travel grant for undergraduate Christie Williams, \$300.

URI Mentor, College of Natural Sciences Undergraduate Research Institute Award, \$4000 funded to one undergraduate student for 10 weeks of research under my supervision, summer 2007.

External Service and Outreach Activities

Reviewed a paper for 41st International Symposium on Mathematical Foundations of Computer Science, August 2016.

Technical Papers Area Chair for the Programming Systems track at Supercomputing 2016.

Doctoral Showcase Program Committee, Supercomputing 2016.

Program committee member for Languages and Compilers for Parallel Computing (LCPC), 2016.

Program committee member for 3rd Annual Chapel Implementers and Users Workshop (CHI UW) 2016.

Program committee member for Ph.D. Forum, ISC High Performance, June 2016.

Light program committee member for Programming Language Design and Implementation (PLDI) 2016. Reviewed 8 papers and participated in half-day, remote PC meeting.

Co-chair for The 6th International Workshop on Polyhedral Compilation Techniques (IMPACT) 2016.

National Science Foundation Panel, 2016.

Reviewed grant proposal for Swiss National Science Foundation, 2016.

Mentor at Open Source Day at Grace Hopper Celebration of Women in Computing, 2015.

Program committee member for EduHPC at Supercomputing 2015.

Program committee member for LLVM in HPC Workshop at Supercomputing 2015.

Mentor for Mentor-Protege Program at Supercomputing, 2015.

Member of JPDC Editorial Board July 2015 to present.

Program committee member for Programming Language Design and Implementation (PLDI) 2015.

Program committee member for the ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP) 2015.

Hour of Code presentation at local library, December 2014.

Publicity co-chair for Rocky Mountain Celebration of Women in Computing (RMCWiC) 2014.

Program committee member for Supercomputing 2014, technical program and BOFs.

Program committee member for Supercomputing 2014.

Program Co-chair for The 15th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC), held in conjunction with IPDPS, 2014.

Reviewer, International Symposium on Code Generation and Optimization (CGO), 2014.

External program committee for The 19th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), 2014.

Program committee member for International Workshop on Polyhedral Compilation (IMPACT), 2014.

Doctoral Showcase Committee, Supercomputing, 2013.

Judge for Student Research Competition at International Conference on Supercomputing (ICS), June 2013.

Program committee member for International Workshop on Polyhedral Compilation (IMPACT), 2013.

NSF panel, 2013.

NSF ad hoc review, 2013.

Program committee member for The 26th International Workshop on Languages and Compilers for Parallel Computing (LCPC), 2013.

Program committee member for The 25th International Workshop on Languages and Compilers for Parallel Computing (LCPC) 2012.

Program committee member for Supercomputing 2012.

Program committee member for Grace Hopper 2012.

Co-chair for the Rocky Mountain Celebration of Women in Computing (RMCWiC), 2012.

Co-organizer for Automatic Differentiation Workshop, 2012.

Program committee member for Principles and Practice of Parallel Computing (PPOPP), 2011.

Program committee member for Parallel Architectures and Compilation Techniques (PACT), 2011.

Program committee member for Memory Systems Performance and Correctness (MSPC), 2011.

Program committee member for the Workshop on Program Analysis for Software Tools and Engineering (PASTE), 2011.

Co-chair (general and program) for The 24th International Workshop on Languages and Compilers for Parallel Computing (LCPC), September 2011.

Program committee member for Programming Language Design and Implementation (PLDI), 2008, 2011.

Scholarship committee for Grace Hopper Celebration of Women in Computing (GHC), 2007, 2008, 2009, 2010, 2011.

Co-organizer for Concurrent Collections Workshop 2010.

Co-organizer for The First Workshop on Advances in Message Passing (co-located with PLDI 2010), June 6, 2010.

Program committee member for the IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2008, 2010.

Program committee member for Languages and Compilers for Parallel Computing (LCPC), 2010.

Program committee member for the Colorado Celebration of Women in Computing, 2010.

Program committee member for the ACM International Conference on Computing Frontiers, 2010.

Program committee member for the IEEE International Conference on High Performance Computing and Communications (HPCC), 2010.

Co-organizer for the Front Range Architecture Compilers Tools and Languages Workshop, April 25, 2009.

Program committee member for Supercomputing (SC), 2004, 2005, 2008.

Tutorials chair for Programming Language Design and Implementation (PLDI), 2007.

Co-organizer for the Workshop on Domain-Specific Languages for Numerical Optimization (DSLOpt) held at Argonne National Laboratory, August 2004.

Program committee member for the ACM SIGPLAN Symposium on Library-Centric Software Design (LCSD), 2007.

Program committee member for the International Conference on Parallel Processing (ICPP), 2006, 2007.

Program committee member for the 13th IEEE International Conference on High Performance Computing (HiPC), 2006.

External committee member for Programming Language Design and Implementation, PLDI 2009.

Two NSF Panels, 2008.

Led panel, "Confidential Advice for Junior Faculty", Grace Hopper Celebration of Women in Computing (GHC), October 2008.

BOF program committee member for Grace Hopper Celebration of Women in Computing Conference 2004.

Reviewer for International Journal of Parallel Processing (IJPP), IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE Transactions on Software Engineering (TSE), ACM Transactions on Programming Languages and Systems (TOPLAS), ACM Transactions on Design Automation of Electronic Systems (TODAES), International Journal of High Performance Computing Applications (IJHPCA), Scientific Programming journal, Microprocessors and Microsystems journal, Journal of Computational Science, Journal of Experimental Algorithmics, X10 Workshop at PLDI 2011, Principles of Programming Languages (POPL) 2010, Principles and Practice of Parallel Programming (PPOPP) 2010, the International Conference on Parallel Processing (ICPP), ASPLOS 2008, PLDI 2007, EuroPar, Frontiers, IPDPS, LCPC, and ICA3PP2K.

Internal Service Activities

Professor at University of Arizona

Women in Computing faculty advisor, Fall 2015 through Spring 2016.

Graduate recruiting and admissions committee, Fall 2015 through Spring 2016.

Faculty hiring committee, Fall 2015.

Assistant and Associate Professor at Colorado State University

Graduate Program Director, June 2014 to April 2015.

Status of Women in Computing Committee, June 2014 to June 2015.

Chair of Graduate Recruitment Committee, Summer 2012 to Summer 2013.

Faculty Hiring Committee, August 2011 through Spring 2012.

Executive Committee, May 2011 to May 2013.

Graduate Recruitment Committee in Summer 2010 to present. Led effort to provide a funding guarantee to qualified PhD students and online pre-applications.

Facilities Committee in Summer 2009 to Spring 2010.

Faculty Hiring Committee in July 2008 through Spring 2009.

Judge for Celebrate Undergraduate Research and Creativity Poster session (CURC), April 2008, 2009.

Undergraduate committee member, July 2007 to May 2008.

Committee member for Sites/Regelson Scholarship, 2006 and 2007.

Panel member for UPE session on giving talks, November 2006.

Facilities committee member, Fall 2006 through June 2007.

Graduate Student at University of California, San Diego

Organized "How to get a job seminar," Fall 2003.

Graduate Co-chair of Women in Computing (WIC@UCSD), 1999-2000.

Authored the initial constitution and organized the startup of the group.

Representative for the Graduate Student Association (GSA), 1999-2000.

Successfully lobbied for TA lockers.

Journal Papers

- J-8 Michelle Mills Strout, Alan LaMielle, Larry Carter, Jeanne Ferrante, Barbara Kreaseck, Catherine Olschanowsky. "An Approach for Code Generation in the Sparse Polyhedral Framework." *Parallel Computing*, vol. 53, April 2016, pgs. 32-57, doi:10.1016/j.parco.2016.02.004.
- J-7 Chris Wilcox, Michelle Mills Strout, and James Bieman. "An optimization-based approach to lookup table program transformations." *Journal of Software: Evolution and Process*, September 2013.
- J-6 Lakshminarayanan Renganarayana, Daegon Kim, Michelle Mills Strout, and Sanjay Rajopadhye. "Parameterized Loop Tiling." *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 34(1), article 3, ACM New York, NY, USA, May 2012.
- J-5 Christopher Wilcox, Michelle Mills Strout, and Jim Bieman. "Tool support for software lookup table optimization." *Scientific Programming*, 19(4):213-229, December 2011.
- J-4 Andrew Stone, Michelle Mills Strout, and Shweta Behere. "May/Must Analysis and the DFAGen Data-flow Analysis Generator." *Information and Software Technology*, 51(10):1440-1453, October 2009.

- J-3 J. Utke, U. Naumann, M. Fagan, N. Tallent, M. Strout, P. Heimbach, C. Hill, and C. Wunsch. “OpenADF: A Modular, Open-Source Tool for Automatic Differentiation of Fortran Codes.” *ACM Transactions on Mathematical Software*, 34(4):1-36, July 2008.
- J-2 Michelle Mills Strout, Larry Carter, Jeanne Ferrante, and Barbara Kreaseck. “Sparse Tiling for Stationary Iterative Methods.” *International Journal of High Performance Computing Applications*, 18(1):95-114, February 2004.
- J-1 Alan Su, Francine Berman, Rich Wolski, and Michelle Mills Strout. “Using AppLeS to Schedule a Distributed Visualization Tool on the Computational Grid.” *International Journal of High-Performance Applications*, Volume 13, Issue 3, pp. 253-262, Fall 1999.

Refereed Book Chapters

- BC-1 Gautam Gupta, Lakshminarayanan Renganarayanan, Sanjay Rajopadhye, and Michelle Strout. “Computations on Iteration Spaces.” In *The Compiler Design Handbook: Optimization and Machine Code Generation*, 2nd edition, 2007.

Refereed Conference and Workshop Papers

- C-40 Anand Venkat, Mahdi Soltan Mohammadi, Hongbo Rong, Rajkishore Barik, Jongsoo Park, Michelle Mills Strout, and Mary Hall. “Automating Wavefront Parallelization for Sparse Matrix Computations.” To be published in Proceedings of Supercomputing 2016. (Best Paper Nomination, acceptance rate: 82 out of 446, 18.4%)
- C-39 Anand Venkat, Mary Hall, and Michelle Mills Strout. “Loop and Data Transformations for Sparse Matrix Code.” In Programming Languages Design and Implementation (PLDI), June 2015. (acceptance rate: 58 out of 303, 19.1%)
- C-38 Ian J. Bertolacci, Catherine Olschanowsky, Ben Harshbarger, Bradford L. Chamberlain, David G. Wonnacott, and Michelle Mills Strout. “Parameterized Diamond Tiling for Stencil Computations with Chapel parallel iterators.” In the Proceedings of the 29th International Conference on Supercomputing (ICS), June 2015. (acceptance rate: 40 out of 160, 25%)
- C-37 Catherine Olschanowsky, Stephen Guzik, John Loffeld, Jeffrey Hittinger, and Michelle Strout. “A Study on Balancing Parallelism and Data Locality in Stencil Calculations.” In the Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC), November 2014. (acceptance rate: 82 out of 394, 20.8%)
- C-36 Michael Norrish and Michelle Mills Strout. “An Approach for Proving the Correctness of Inspector/Executor Transformations.” Languages and Compilers for Parallel Computing (LCPC), September 2014.
- C-35 Michelle Mills Strout, Fabio Luporini, Christopher D. Krieger, Carlo Bertolli, Gheorghe-Teodor Bercea, Catherine Olschanowsky, J. Ramanujam, and Paul H.J. Kelly. “Generalizing Run-time Tiling with the Loop Chain Abstraction.” In 28th IEEE International Parallel and Distributed Processing Symposium (IPDPS), May 19-23, 2014. (acceptance rate: 114 out of 541, 21.1%)
- C-34 Anand Venkat, Manu Shantharam, Mary Hall, and Michelle Mills Strout. “Non-affine Extensions to Polyhedral Code Generation.” To appear in International Symposium on Code Generation and Optimization (CGO), Feb 15-19, 2014. (acceptance rate: 29 out of 103, 28.2%)
- C-33 Andrew Stone and Michelle Mills Strout. “Programming Abstractions to Separate Concerns in Semi-Regular Grids.” In the Proceedings of the 27th International Conference on Supercomputing (ICS), June 12, 2013. (acceptance rate: 42 out of 203, 20.6%)
- C-32 Christopher D. Krieger, Michelle Mills Strout, Catherine Olschanowsky, Andrew Stone, Stephen Guzik, Xinfeng Gao, Carlo Bertolli, Paul H.J. Kelly, Gihan Mudalige, Brian Van Straalen, and Sam Williams. “Loop Chaining: A Programming Abstraction For Balancing Locality and Parallelism.” In the Proceedings of the 18th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS), May, 20, 2013. (acceptance rate: 9 out of 29, 31%)

- C-31 Dave G. Wonnacott and Michelle Mills Strout. "On the Scalability of Loop Tiling Techniques." In the Proceedings of the 3rd International Workshop on Polyhedral Compilation Techniques (IMPACT), January 21, 2013.
- C-30 Christopher D. Krieger, Michelle Mills Strout, Jon Roelofs, and Amanreet Bajwa. "Executing Optimized Irregular Applications Using Task Graphs Within Existing Parallel Models." In the Proceedings of the Second Workshop on Irregular Applications: Architectures and Algorithms (*IA³*) held in conjunction with SC12, November 11, 2012.
- C-29 Michelle Mills Strout, Geri Georg, and Catherine Olschanowsky. "Set and Relation Manipulation for the Sparse Polyhedral Framework." In the Proceedings of the 25th International Workshop on Languages and Compilers for Parallel Computing (LCPC), September 2012. (acceptance rate: 16 out of 39, 41.0%)
- C-28 Christopher D. Krieger and Michelle Mills Strout. "A Fast Parallel Graph Partitioner for Shared-Memory Inspector/Executor Strategies." In the Proceedings of the 25th International Workshop on Languages and Compilers for Parallel Computing (LCPC), September 2012. (acceptance rate: 16 out of 39, 41.0%)
- C-27 Chris Wilcox, Michelle Mills Strout, and James Bieman. "Optimizing Expression Selection for Lookup Table Program Transformation." To appear in the Proceedings of the 12th IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM), September 2012. (acceptance rate: 16 out of 40, 40.0%)
- C-26 Andrew I. Stone, John M. Dennis, and Michelle Mills Strout. "Evaluating Coarray Fortran with the CGPOP Miniapp." In the Proceedings of the Partitioned Global Address Space Conference, October 2011.
- C-25 Chris Wilcox, Michelle Mills Strout, and James Bieman. "Mesa: Automatic Generation of Lookup Table Optimizations." In the Proceedings of the 4th International Workshop on Multicore Software Engineering, May 2011.
- C-24 Stephanie Dinkins, Barbara Kreaseck, and Michelle Mills Strout. "Steps Toward Simplifying Sparse Matrix Data Structures." In the Proceedings of the Colorado Celebration of Women in Computing (CCWIC), November 4-5, 2010.
- C-23 Christopher D. Krieger and Michelle Mills Strout. "Performance Evaluation of an Irregular Application Parallelized in Java." In the Proceedings of the First International Workshop on Parallel Software Tools and Tool Infrastructures (PSTI), September 13, 2010.
- C-22 Christopher D. Krieger, Andrew Stone, and Michelle Mills Strout. "Qualitative Evaluation Criteria for Parallel Programming Models." In the Proceedings of Fun Ideas and Thoughts session (FIT, co-located with PLDI 2010), June 8, 2010.
- C-21 Barbara Kreaseck, Michelle Mills Strout, and Paul Hovland. "Depth Analysis of MPI Programs." In the Proceedings of The First Workshop on Advances in Message Passing (AMP, co-located with PLDI 2010), June 6, 2010. (acceptance rate: 10 out of 12, 83.3%)
- C-20 Andrew I. Stone, Steven DiBenedetto, Michelle Mills Strout, and Daniel Massey. "Scalable Simulation of Complex Network Routing Policies." In the *Proceedings of the ACM International Conference on Computing Frontiers (CF)*, May 2010. (acceptance rate: 30 out of 113, 26.5%)
- C-19 Christopher D. Krieger, Andrew Stone, and Michelle Mills Strout. "Mechanisms that Separate Algorithms from Implementations for Parallel Patterns," in Workshop on Parallel Programming Patterns (ParaPLOP), March 2010.

- C-18 Ilya Safro, Paul Hovland, Jaewook Shin, and Michelle Strout. "Improving Random Walk Performance." In the *Proceedings of the International Conference on Scientific Computing (CSC)*, July 2009. (acceptance rate: 27%)
- C-17 Michelle Mills Strout, Nissa Osheim, Dave Rostron, Paul D. Hovland, and Alex Pothen. "Evaluation of Hierarchical Mesh Reorderings." In *Proceedings of the International Conference on Computational Science*, May 2009. (acceptance rate: 40%)
- C-16 Andrew Stone, Michelle Mills Strout, and Shweta Behere. "Automatic Determination of May/Must Set Usage in Data-Flow Analysis." In *Proceedings of the Eighth IEEE International Working Conference on Source Code Analysis and Manipulation*, September 2008. (acceptance rate: 23 out of 61, 37.7%)
- C-15 Nissa Osheim, Michelle Mills Strout, David Rostron, and Sanjay Rajopadhye. "Smashing: Folding Space to Tile Through Time." In *The 15th Workshop on Languages and Compilers for Parallel Computing (LCPC)*, July 2008. (acceptance rate: 18 out of 35, 51.4%)
- C-14 Daegon Kim, Lakshminarayanan Renganarayana, Dave Rostron, Sanjay Rajopadhye, and Michelle Mills Strout. "Multi-level Tiling: m for the Price of One." In *Proceedings of the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC)*, November 2007. (acceptance rate: 54 out of 268, 20.1%)
- C-13 David Bolme, Michelle Mills Strout, and Ross Beveridge. "FacePerf: Benchmarks for Face Recognition Algorithms." In *Proceedings of The IEEE International Symposium on Workload Characterization (IISWC)*, September 2007. (acceptance rate: 4 out of 8, 50%)
- C-12 Lakshminarayanan Renganarayana, Daegon Kim, Sanjay Rajopadhye, and Michelle Mills Strout. "Parameterized Tiled Loops for Free." In *Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2007. (acceptance rate: 45 out of 178, 25%)
- C-11 Paul Hovland, Boyana Norris, Michelle Mills Strout, and Jean Utke. "Term Graphs for Computing Derivatives in Imperative Languages." *Electronic Notes in Theoretical Computer Science*. May 2007. Also Preprint ANL/MCS-P1311-0106, January 2006.
- C-10 Michelle Mills Strout, Barbara Kreaseck, and Paul Hovland. "Data-Flow Analysis for MPI Programs." In *Proceedings of the The International Conference on Parallel Processing (ICPP)*, August 2006. (acceptance rate: 64 out of 200, 32%)
- C-9 Michelle Mills Strout and Paul Hovland. "Linearity Analysis for Automatic Differentiation." In *Proceedings of the The Workshop on Automatic Differentiation: Tools and Applications at ICCS 2006*, May 28-31, 2006. (acceptance rate: 9 out of 15, 60%)
- C-8 Barbara Kreaseck, Luis Ramos, Scott Easterday, Michelle Mills Strout and Paul Hovland. "Hybrid Static/Dynamic Activity Analysis." In *Proceedings of the The Workshop on Automatic Differentiation: Tools and Applications at ICCS 2006*, May 28-31, 2006. (acceptance rate: 9 out of 15, 60%)
- C-7 U. Naumann, J. Utke, Carl Wunsch, C. Hill, P. Heimbach, M. Fagan, N. Tallent, and M. Strout. "Adjoint Code by Source Transformation with OpenAD/F." In *Proceedings of the European Conference on Computational Fluid Dynamics (ECCOMAS CFD)*, 2006.
- C-6 Michelle Mills Strout, John Mellor-Crummey, and Paul D. Hovland. "Representation-Independent Program Analysis." In *Proceedings of the The sixth ACM SIGPLAN-SIGSOFT Workshop on Program Analysis for Software Tools and Engineering*, September 5-6, 2005. (acceptance rate: 17 out of 42, 40.45%)

- C-5 Michelle Mills Strout and Paul Hovland. "Metrics and models for reordering transformations." In *The Proceedings of the Second ACM SIGPLAN Workshop on Memory System Performance (MSP)*, June 2004. (acceptance rate: 7 out of 12, 58.33%)
- C-4 Michelle Mills Strout, Larry Carter, and Jeanne Ferrante. "Compile-time Composition of Run-time Data and Iteration Reorderings." In *Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, June 2003. (acceptance rate: 28 out of 131, 21%)
- C-3 Michelle Mills Strout, Larry Carter, Jeanne Ferrante, Jonathan Freeman, and Barbara Kreaseck. "Combining Performance Aspects of Irregular Gauss-Seidel via Sparse Tiling." *The 15th Workshop on Languages and Compilers for Parallel Computing (LCPC)*, College Park, Maryland, July 25-27, 2002. LNCS 2481, Springer-Verlag, 2005. (acceptance rate: 26 out of 32, 81%)
- C-2 Michelle Mills Strout, Larry Carter, and Jeanne Ferrante. "Rescheduling for Locality in Sparse Matrix Computations." *International Conference on Computational Science (ICCS)*, May 2001. Published in Springer Lecture Notes in Computer Science LNCS 2073.
- C-1 Michelle Mills Strout, Larry Carter, Jeanne Ferrante, and Beth Simon. "Schedule-Independent Storage Mapping in Loops." In the proceedings of *Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, San Jose, CA, October 1998. (acceptance rate: 28 out of 123, 23%)

Other Papers

- P-13 Timothy T. Lenczycki, Kelly Suto, Christina Williams, and Michelle Mills Strout. "The Chemistry Between High School Students and Computer Science." Tech report, arXiv:1406.2222, June 9, 2014.
- P-12 Michelle Mills Strout, Alan LaMielle, Larry Carter, Jeanne Ferrante, Barbara Kreaseck, and Catherine Olschanowsky. "An Approach for Code Generation in the Sparse Polyhedral Framework." Colorado State University Tech Report #CS-13-109, December, 2013.
- P-11 Michelle Mills Strout. "Compilers for Regular and Irregular Stencils: Some Shared Problems and Solutions." Proceedings of Workshop on Optimizing Stencil Computations (WOSC), October 27, 2013.
- P-10 David G. Wonnacott and Michelle Mills Strout. "On the Scalability of Loop Tiling Techniques." Dept. of Computer Science, Haverford College, Haverford PA Technical report 2012-01, August 2012.
- P-9 Andrew Stone, John Dennis, and Michelle Mills Strout. "Establishing a Miniapp as a Programmability Proxy." Presented at the Exascale Research Conference, April 16-18, 2012.
- P-8 Michelle Mills Strout, Christopher Krieger, Andrew Stone, Christopher Wilcox, John Dennis, and James Bieman. "Evaluating the Separation of Algorithm and Implementation within Existing Programming Models." In *Proceedings of SciDAC*, July 2011.
- P-7 Andrew Stone, John Dennis, and Michelle Mills Strout. "The CGPOP Miniapp, Version 1.0," Technical Report CS-11-103 Colorado State University, July 2011.
- P-6 Alan LaMielle and Michelle Mills Strout. "Enabling Code Generation within the Sparse Polyhedral Framework," Technical Report CS-10-102 Colorado State University, March 2010.
- P-5 Andrew I. Stone, Steven DiBenedetto, Michelle Mills Strout, and Daniel Massey. "Simulating Internet Scale Topologies With Metarouting," Technical Report CS-10-103 Colorado State University, March 2010.
- P-4 A. Pothen, A.H. Gebremedhin, F. Dobrian; E.G. Boman, K.D. Devine, B.A. Hendrickson; P. Hovland, B. Norris, J. Utke; U. Catalyurek; M.M. Strout. "Combinatorial Algorithms for Petascale Science," *SciDAC Review*, Issue 5, pp 26-35, Fall 2007.

- P-3 Erik G Boman, Doruk Bozdog, Umit V Catalyurek, Karen D Devine, Assefaw H Gebremedhin, Paul D Hovland, Alex Pothan, and Michelle Mills Strout. "Enabling high performance computational science through combinatorial algorithms." In *Proceedings of the SciDAC*, Journal of Physics: Conference Series, Volume 78, June 2007.
- P-2 Paul Hovland, Boyana Norris, Michelle Mills Strout, Sanjukta Bhowmick, and Jean Utke. "Sensitivity Analysis and Design Optimization through Automatic Differentiation." In *Proceedings of SciDAC 2005*, *Journal of Physics: Conference Series*, volume 16.
- P-1 Michelle Mills Strout, Larry Carter, and Jeanne Ferrante. Proof of Correctness for Sparse Tiling of Gauss-Seidel. UCSD Department of Computer Science and Engineering, Technical Report #CS2003-0741, April 2003.

Refereed Talks and Posters

- RP-15 Michelle Strout in collaboration with Ian Bertolacci, Catherine Olschanowsky, Brad Chamberlain, Ben Harshbarger, and David Wonnacott. "Practical Diamond Tiling for Stencil Computations Using Chapel Iterators," Presented at the ACM SIGPLAN 2nd Annual Chapel Implementers and Users Workshop (CHI UW), June 2015.
- RP-14 Ian Bertolacci, advisors: Michelle Strout and Catherine Olschanowsky. "Chapel Iterators: Providing Tiling for the Rest of Us," won 3rd place in Supercomputing SRC for undergraduates, November 2014.
- RP-13 Speaker: Ian J. Bertolacci Authors: Ian J. Bertolacci, Catherine Olschanowsky, Michelle Mills Strout, and David G. Wonnacott, In Collaboration With Bradford L. Chamberlain and Ben Harshbarger. "Chapel Iterators: Providing Tiling for the Rest of us," Presented at SuperComputing 2014 as part of SC14 Chapel Lightning Talks BoF, November 2014.
- RP-12 David Wonnacott and Michelle Mills Strout. "On the Scalability of Loop Tiling Techniques," talk at the Fourth Annual CnC Workshop, December 2012.
- RP-11 Andrew I. Stone and Michelle Mills Strout. "Abstractions for Defining Semi-Regular Grids Orthogonally from Stencil Computations," poster with two page abstract to appear at LCPC, September 2012.
- RP-10 Andrew I. Stone, John M. Dennis, and Michelle Mills Strout. "Establishing a Miniapp as a Programmability Proxy," poster with two page abstract at PPOPP, February 2012.
- RP-9 Samantha Wood with Advisor Michelle Mills Strout. "SMOREs: Sparse Matrix Omens of Reordering Success," poster at the Programming Languages Design and Implementation (PLDI) Student Research Competition, *Winner of the PLDI SRC*, June 2011.
- RP-8 Amanreet Bajwa with Advisor Michelle Mills Strout. "Molecular Dynamics Task graph," poster at Grace Hopper Celebration of Women in Computing, November 2011.
- RP-7 Samantha Wood with Advisor Michelle Mills Strout. "Improving Performance of the Sparse Matrix Power Kernel through Matrix Reorderings," poster at Grace Hopper Celebration of Women in Computing, September 2010.
- RP-6 Jon Roelofs and Michelle Strout, "CnC-Based Transformations for Scalable Parallelization of Jacobi," The Second Annual Concurrent Collections Workshop, October 6th 2010. Jon Roelofs, an undergraduate at CSU, gave the talk.
- RP-5 Christie Williams and Michelle Mills Strout. "Introducing High School Chemistry Students to Computer Science," poster at SigCSE conference (ACM Special Interest Group on Computer Science Education), May 2009.

- RP-4 Michelle Mills Strout. "Using Hypergraphs and Bipartite Graphs for Run-Time Data and Computation Reordering." Talk abstract for SIAM Workshop on Combinatorial Scientific Computing, February 17-18, 2007. (acceptance rate: 58%)
- RP-3 Michelle Mills Strout and Paul Hovland. "Using Hypergraphs to Improve Iteration Reordering Heuristics." Talk abstract for SIAM Workshop on Combinatorial Scientific Computing, February 27-28, 2004.
- RP-2 Michelle Mills Strout, Larry Carter, and Jeanne Ferrante. "Managing Tile Size Variance in Serial Sparse Tiling." Poster presented at *Supercomputing 2001*, Denver, Colorado.
- RP-1 Tung Nguyen, Michelle Mills Strout, Larry Carter, and Jeanne Ferrante. "Asynchronous Dynamic Load Balancing of Tiles." In the proceedings of *Ninth SIAM Conference on Parallel Processing for Scientific Computing*, San Antonio, Texas, March 22-24, 1999.

Invited Talks

- T-22 "Correct and Efficient Run-time Parallelization," with Michael Norrish at Australia National University, April 5, 2014.
- T-21 "Compilers for Regular and Irregular Stencils: Shared Problems and Solutions," presented at The University of New South Wales, February 5, 2014.
- T-20 "Compilers for Regular and Irregular Stencils: Shared Problems and Solutions," presented at the Workshop on Optimizing Stencil Computations (WOSC) associated with OOPSLA, October 27, 2013.
- T-19 "Bulk Synchronous to Asynchronous Parallelism: Using Loop Chains and Full Sparse Tiling to Get There," presented at Australian National University, August 16, 2013.
- T-18 "Automating Run-Time Reordering Transformations with the Sparse Polyhedral Framework (SPF)," presented at Australian National University in Canberra, July 12, 2012.
- T-17 "Automating Run-Time Reordering Transformations with the Sparse Polyhedral Framework (SPF) and Arbitrary Task Graphs," presented at Imperial College in London, November 21, 2011.
- T-16 "SAIMI: Separating the Algorithm from the Implementation Details," presented at the DOE ASCAC Meeting , August 24, 2011.
- T-15 "Autotuning Needs for Run-Time Reordering Transformations," presented at the CScADS Autotuning Workshop, August 8, 2011.
- T-14 "SAIMI and SPF: Separating the Algorithm from the Implementation Details in Sparse Computations," presented at 2011 DOE Scientific Discovery through Advanced Computing (SciDAC) conference, July 12, 2011.
- T-13 "PIES: Parallelization using Inspector/Executor Strategies," presented at CSU Best Practices Lunch, November 17, 2010.
- T-12 "A Speedy Tutorial on High Performance Computing," presented at Colorado Celebration of Women in Computing, November 5, 2010.
- T-11 "Introducing the Sparse Polyhedral Framework (SPF)," presented at The Parallel Computing Laboratory (ParLab) at Berkeley, November 1, 2010.
- T-10 "Introducing the Sparse Polyhedral Framework (SPF)," presented at the Computer Science department at Rice University, August 27, 2010.
- T-9 "Introducing the Sparse Polyhedral Framework (SPF)," presented at the CU Boulder department colloquium, January 28, 2010.

- T-8 “OpenAnalysis: High-level Program Analysis,” presented at IBM Watson Research Center, June 2008.
- T-7 “Communication Avoidance for Sparse Applications Using Full Sparse Tiling,” presented at the MiniSymposium *Communication Avoiding Linear Algebra* held at SIAM Conference on Computational Science and Engineering, February 12-13, 2008.
- T-6 “Domain-Specific Program Analysis with OpenAnalysis,” presented at the MiniSymposium *Trends in the Evolution of Scientific Computing Software* held at SIAM Conference on Computational Science and Engineering, February 19-23, 2007.
- T-5 “Representation-Independent Compiler Analysis and Data-flow Analysis for MPI Programs,” presented at Cornell April 2006.
- T-4 “Automatic Generation of Run-time Reordering Inspectors,” presented at High Level Programming for High Performance Embedded Computing Systems Retreat, HiPHiPECS May 2006.
- T-3 “Domain-Specific Data-Flow Analysis and Other Analysis Problems,” presented at High Level Programming for High Performance Embedded Computing Systems Retreat, HiPHiPECS May 2005.
- T-2 “Performance Transformations for Irregular Applications,” presented at William and Mary, Williamsburg, Virginia, April 2004.
- T-1 “Performance Transformations for Irregular Applications,” presented at Colorado State, Fort Collins, Colorado, February 2004.

Posters and Other Talks

- P-29 Anthony Gabriel Encinas, advisor: Michelle Strout. “Today’s Computers Have Limits: Let’s Break Them with Quantum Computing!” Won honorable mention in the Analytical Research category at the First Year Honors Project Showcase at the University of Arizona, May 2016.
- P-28 Ian Bertolacci, advisors: Michelle Strout and Catherine Olschanowsky. “Orthogonal Scheduling of Stencil Computations with Chapel Iterators,” won Best Undergraduate Poster at the Rocky Mountain Celebration of Women in Computing (RMCWiC), October 2014.
- P-27 “Grad School and Postdoc Positions in the United States,” presented at Australia National University to about 30 undergraduate and graduate students, October 17, 2013.
- P-26 “The CGPOP Miniapp,” by Andrew Stone, John Dennis, and Michelle Strout. Presented by Andrew Stone at HPC 2011 - First Annual Front Range High Performance Computing Symposium, September 23-24, 2011.
- P-25 “Sparse Polyhedral Framework and CACHE,” presented at the Algorithms and Software for Communication Avoidance and Communication Hiding at the Extreme Scale (CACHE Institute) PI meeting, August 2, 2011.
- P-24 “The CGPOP Miniapp,” by John Dennis (NCAR), Andrew Stone (Colorado State University), Michelle Mills Strout (Colorado State University). Presented at the DOE Scientific Discovery through Advanced Computing (SciDAC) conference, July 12, 2011.
- P-23 “MeggyJava: Making the Compilers Course More Attractive to Undergraduate Students,” by Ryan Moore. Advisor: Dr. Michelle Strout. Presented at CURC, April 2011.
- P-22 “Asynchronous Parallelism in Sparse Linear Algebra,” Jon Roelofs and Michelle Strout, presented at CURC, April 2011.
- P-21 “Having Fun with Computer Science and Compilers,” guest speaker for introductory CS course, October 2010.
- P-20 “Separating Algorithm and Implementation via programming Model Injection (SAIMI),” talk presented to the CSU Software Engineering research group, April 22, 2010.

- P-19 “Introducing the Sparse Polyhedral Framework,” talk presented at Front Range Architecture, Compilers, Tools, and Languages Workshop (FRACTAL), December 5, 2009.
- P-18 “Having Fun with Computer Science and Compilers,” guest speaker for introductory CS course, November 2009.
- P-17 “Some CS Education Practice and Theory: High Performance Computing Perspective,” talk presented at Industrial Advisory Board Meeting, October 2008.
- P-16 “Research Opportunities at CSU in Compilers and Scientific Computing,” talk presented at department seminar (BMAC), September 2008.
- P-15 “Pizza and PIES (Parallelization Using Inspector/Executor Strategies),” talk presented by Michelle Strout, Tim Lenczycki, Kelly Suto, Christie Williams, Alan LaMielle, Kate Ericson, and Jeshua Bratman, August 2008.
- P-14 “DFAVis: A Visual Debugger,” poster presented by Kiley Graim at the Colorado Celebration of Women in Computing (CCWIC), April 2008.
- P-13 “Scalability and Register Tiling in the Shallow Water Model,” poster presented by Christie Williams at Celebrate Undergraduate Research and Creativity Poster session (CURC), April 2008.
- P-12 “Parallelizing Irregular Gauss-Seidel Using Full Sparse Tiling,” talk presented at Front Range Architecture, Compilers, Tools, and Languages Workshop (FRACTAL), April 26, 2008.
- P-11 “Runtime Reordering Transformations”, talk presented at Future of PL Research and Education Workshop at PLDI 2008 PC meeting, January 26, 2008.
- P-10 “Generation of Pointer Cognizant Data-Flow Analyses From Succinct Specifications,” presented at Front Range Architecture, Compilers, Tools, and Languages Workshop (FRACTAL), October 14, 2007 presented by Andrew Stone.
- P-9 “Smashing Periodic Domains,” presented at FRACTAL, October 14, 2007 presented by Nissa Osheim and David Rostron.
- P-8 “Representation-Independent Alias Analysis and Data-Flow Analysis,” presented at Front Range Architecture, Compilers, Tools, and Languages Workshop (FRACTAL), February 10, 2007.
- P-7 “Combinatorial Scientific Computing and Petascale Simulations (CSCAPES) SciDAC Applied Math Institute,” poster by Alex Pothen, Florin Dobrian and Assefaw Gebremedhin, Old Dominion University Erik Boman, Karen Devine and Bruce Hendrickson, Sandia National Laboratories Paul Hovland, Sanjukta Bhowmick, Boyana Norris and Jean Utke, Argonne National Laboratory, Umit Catalyurek, Ohio State University, Michelle Strout, Colorado State University, SciDAC Organizational Meeting, February 2007.
- P-6 “Automatic Generation of Bit-vector Analysis Using OpenAnalysis,” poster by Shweta Behere, Michelle Strout, and Paul Hovland, ISTeC Student Research Poster Contest, November 29, 2006.
- P-5 “Linearity Analysis: An Example Domain-Specific Analysis,” talk presented at the Workshop on Domain-Specific Languages for Numerical Optimization (DSLOpt) August 18-20, 2004.
- P-4 “Using the OpenAnalysis Toolkit with OpenAD”, Poster at the 4th International conference on Automatic Differentiation, July 2004.
- P-3 “Performance Transformations for Irregular Applications,” talk presented at the University of Chicago Computation Institute Brown Bag Lunch, October 30, 2003.
- P-2 “Tiling for Iterative Sparse Matrix Computations”, talk presented at Research, Careers, and Computer Science: A Maryland Symposium, Fall 2001.
- P-1 “Storage Allocation for Register Tiling”, talk presented at Dagstuhl, Instruction Level Parallelism, April 1999.