



RICHARD WILSON VUDUC

CURRICULUM VITÆ

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College of Computing  
School of Computational Science and Engineering

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Richard Wilson Vuduc: *Curriculum Vitæ*, © April 2017

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Part I

CURRICULUM VITÆ

## BIOGRAPHICAL DATA

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### 1.1 EDUCATIONAL BACKGROUND

DEGREE	YEAR	UNIVERSITY	FIELD
Ph.D	2004	University of California, Berkeley	Computer Science
B.S.	1997	Cornell University	Computer Science

### 1.2 EMPLOYMENT HISTORY

TITLE	ORGANIZATION	WHEN
Director of CSE Programs	Georgia Tech	Jul. '13–Jan. '17
Associate Chair of Academic Affairs in CSE	Georgia Tech	Aug. '13–Dec. '16
Associate Professor with tenure	Georgia Tech	Mar. '13–present
Assistant Professor	Georgia Tech	Aug. '07–Mar. '13
Postdoc	Lawrence Livermore National Laboratory	Nov. '04–Jul. '07
Postdoc	University of California, Berkeley	Jan. '04–Oct. '04
Graduate student	University of California, Berkeley	Aug. '97–Jan. '04
Research Intern	Institute for Defense Analyses	Aug. '94–Jun. '96

### 1.3 CURRENT FIELDS OF INTEREST

MY RESEARCH IN HIGH-PERFORMANCE COMPUTING (HPC) SYSTEMS addresses fundamental questions of how to analyze, to tune, and to debug software automatically for complex and rapidly-evolving architectures, including current multicore and future manycore systems. I am particularly interested in these questions from the perspective of computational science and engineering (CSE) applications, including those that require massive-scale data analysis.

The following are my current focus areas:

- Algorithms and performance analysis, with respect to time, space, energy, and power

- Performance engineering
- Performance and correctness debugging

I believe that the advances my research lab is making in these areas, when taken together, are helping to create more productive environments for developing high-performance algorithms and software.



## 2

## TEACHING

## 2.1 COURSES TAUGHT

WHEN	COURSE	SIZE	SCORE	NOTES
Spring '16	CSE 6220-OMS: Intro to HPC	36	4.8	
Spring '16	CX 4230: Modeling & simulation	29	5.0	New version
Fall '15	CSE 6220-OMS: Intro to HPC	41	4.6	New version
Fall '15	CSE 6040: Comp for Data Analysis	37	4.1	New version
Fall '15	CSE 6001: Intro to CSE	18	4.9	
Spring '15	CX 4230: Modeling & simulation	32	4.9	New version
Fall '14	CSE 6001: Intro to CSE	20	4.1	New version
Fall '14	CSE 6230: High-performance Computing Tools and Applications	41	4.5	
Fall '13	CSE 6001: Intro to CSE	9	4.8	New version
Fall '13	CSE 6230: High-performance Computing Tools and Applications	36	4.1	New version
Spring '13	CSE 6220: Intro to HPC	60	4.4	New version
Fall '12	CSE 6230: High-performance Computing Tools and Applications	55	4.5	New version
Spring '12	CS 4225: Intro to HPC	12	4.4	New version
Fall '11	CSE 6230: HPC Tools & Apps	49	4.3	New version
Spring '11	CS 4335 / CSE/ECE 6730: Modeling and Simulation	36	4.6	New version
Fall '10	CSE 8803 HPC: Hot Topics in Parallel Computing	12	5.0	New course
Spring '10	CS 4225: Introduction to HPC	17	4.5	
Fall '09	CSE 6230: HPC Tools and Applications	13	4.9	
Spring '09	CS 4643 / MATH 4641: Numerical Analysis II	—	—	Cancelled
Fall '08	CSE / CS 6230: HPC Tools and Applications	35	4.1	New version
Spring '08	CSE 8803 PNA: Parallel Numerical Algorithms	21	4.6	New course



NOTE: Scores indicate the *Overall Teaching Effectiveness* summary rating (maximum value is 5.0) given by students in the Georgia Tech Course-Instructor Opinion Survey (CIOS).

## 2.2 INDIVIDUAL STUDENT GUIDANCE

### 2.2.1 *Ph.D. Students Supervised (as primary advisor)*

- Casey BATTAGLINO (CoC/CSE)  
Fall 2010–present
- Daniel BROWNE (CoC/CSE)  
Spring 2012–present
- Kenneth CZECHOWSKI (CoC/CSE)  
Fall 2011–present
- Marat DUKHAN (CoC/CSE)  
Fall 2012–present
- Srinivas ESWAR (CoC/CS)  
Fall 2016–present<sup>1</sup> *New '16-'17 Item*
- Michael ISAEV (CoC/CS)  
Spring 2017–present *New '16-'17 Item*
- Sara KARAMATI (CoC/CSE)  
Fall 2014–present
- Jiajia LI (CoC/CSE)  
Spring 2015–present
- Piyush Kumar SAO (CoC/CSE)  
Fall 2011–present
- Patrick LAVIN (CoC/CSE)  
Fall 2016–present *New '16-'17 Item*
- Zhengkai WU (CoC/ECE)  
Spring 2014–present

Graduated and/or no longer supervising:

- Aparna CHANDRAMOWLISHWARAN (CoC/CSE)  
Fall 2008–Fall 2013  
PLACEMENT: Assistant Professor at UC Irvine
- Jee CHOI (CoE/ECE)  
Fall 2008–Spring 2015  
PLACEMENT: IBM T.J. Watson Research Lab
- Raghul GUNASEKARAN (CoC/CSE)  
Fall 2010–Fall 2012

- Mohammad HOSSAIN (CoC/CS)  
Spring 2014–Fall 2016  
PLACEMENT: Facebook
- Cong Hou (CoC/CS)  
Summer 2009–Spring 2013  
PLACEMENT: Google
- Sangmin PARK (CoC/CS; M.J. Harrold)  
Fall 2008–Summer 2014  
PLACEMENT: Two Sigma

*New '16-'17 Item*

#### 2.2.2 *Ph.D. Students Supervised (as co-advisor)*

- George VULOV (CoC/CSE; R. Fujimoto)  
Fall 2009–Fall 2011

#### 2.2.3 *M.S. Students Supervised*

Graduated and/or no longer supervising:

- Vaibhav BEDIA (CoC/CS)  
Spring 2014–Fall 2014  
PLACED: *Apple*
- Stefan HENNEKING (CoC/CS)  
Spring 2015–Spring 2016 THESIS: Tuned and wildly asynchronous stencil kernels for hybrid CPU/GPU platforms.  
COMMITTEE: Richard VUDUC (advisor, CoC/CSE), Edmond CHOW (CoC/CSE), Mark Adams (Lawrence Berkeley National Laboratory)  
NOW AT: UT Austin (ICES PhD program)
- Robert LEE (CoC/CSE)  
Spring 2014–Spring 2016  
PLACEMENT: Tower Research Capital (NYC)
- Chris McCLANAHAN (CoC/CS)  
Fall 2010–Spring 2011  
PLACED: *AccelerEyes*
- David S. NOBLE, Jr. (CoC/CSE)  
Fall 2010–Spring 2013  
PLACED: *CD-Adapco*
- Shruti PADAMATI (CoC/CS)  
Spring 2014
- Niveditha RAVEENDRAN (CoC/CS)  
Spring 2014  
PLACED: *Oracle*

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<sup>1</sup> I originally met and began working with Srinivas in Spring 2015, when he was an M.S. student at Georgia Tech.

- Archana VENKATESH (CoC/CS)  
Spring 2014–Fall 2014  
PLACED: [Apple](#)
- Sundaresan VENKATASUBRAMANIAN (CoC/CS)  
Spring 2008  
THESIS: Tuned and wildly asynchronous stencil kernels for hybrid CPU/GPU platforms.  
COMMITTEE: Richard VUDUC (advisor, CoC/CSE), Hyesoon KIM (CoC/CS), Jeffrey VETTER (CoC/CSE & ORNL)  
PLACED: [Amazon.com](#)

#### 2.2.4 Undergraduate Students Supervised

Students are from Georgia Tech unless otherwise noted.

- DeVon INGRAM  
Spring 2016
- Chaitanya ALURU (UC Berkeley)  
Summer 2014
- Lawrence MOORE  
Summer 2014
- Austin TUCKER (Morehouse College)  
Summer 2013
- Hyangjin LEE  
Summer 2013
- Lesly SANDOVAL (Georgia State University)  
Summer 2011
- Gurbinder Gill SINGH (IIT-Roorkee)  
Summer 2011
- Ashish NARASIMHAM  
Fall 2009–Fall 2011
- Japnik SINGH (IIT-Bombay)  
Summer 2010
- Piyush Kumar SAO (IIT-Madras)  
Summer 2010
- Nimit NIGANIA (IIT-Madras)  
Summer 2009
- Amik SINGH (IIT-Roorkee)  
Summer 2009
- Jada JEFFRIES (Hampton University)  
Summer 2009

- Gaurav CHADHA (IIT-Guwahati)  
Summer 2008  
PLACED: Ph.D. program at U. Michigan, EECS Dept.
- Lauren GRACIA (U. Houston–Downtown)  
Summer 2008  
PLACED: Chevron

### 2.3 TEACHING HONORS AND AWARDS

- LOCKHEED MARTIN EXCELLENCE IN TEACHING AWARD  
Spring 2013
- THANK-A-TEACHER  
Fall 2012  
CETL and GT Student Ambassadors
- THANK-A-TEACHER  
Spring 2010  
CETL and GT Student Ambassadors
- THANK-A-TEACHER  
Spring 2009  
CETL and GT Student Ambassadors
- OUTSTANDING GRADUATE STUDENT INSTRUCTOR (UC Berkeley)  
Fall 1997  
Awarded to fewer than 10% of graduate students campus-wide.

## RESEARCH

## Web citation indexes:

- Google Scholar: <http://scholar.google.com/citations?user=CCGI7x4AAAAJ&hl=en>
- Microsoft Academic Search: <http://academic.research.microsoft.com/Author/255921/richard-w-vuduc>

## 3.1 THESES

- PH.D.: Automatic performance tuning of sparse matrix kernels  
COMPLETED: January 2004  
ADVISORS: James W. DEMMEL (primary), Katherine A. YELICK

## 3.2 JOURNAL ARTICLES (REFEREED)

- [J1] Sangmin Park, Richard Vuduc, and Mary Jean Harrold. UNICORN: a unified approach for localizing non-deadlock concurrency bugs. *Software: Testing, Verification, and Reliability*, 25(3):167–190, May 2015.  
<http://dx.doi.org/10.1002/stvr.1523>.
- [J2] Agata Rozga, Tricia Z. King, Richard W. Vuduc, and Diana L. Robins. Undifferentiated facial electromyography responses to dynamic, audio-visual emotion displays in individuals with autism spectrum disorders. *Developmental Science*, 2013.  
<http://dx.doi.org/10.1111/desc.12062>.
- [J3] Ilya Lashuk, Aparna Chandramowlishwaran, Harper Langston, Tuan-Ahn Nguyen, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Ying, Denis Zorin, and George Biros. A massively parallel adaptive fast multipole method on heterogeneous architectures. *Communications of the ACM (CACM)*, 55(5):101–109, May 2012.  
Extends conference version: <http://doi.acm.org/10.1145/1654059.1654118>.  
<http://dx.doi.org/10.1145/2160718.2160740>.
- [J4] Jaekyu Lee, Hyesoon Kim, and Richard Vuduc. When prefetching works, when it doesn't, and why. *ACM Trans. Architecture and Code Optimization (TACO)*, 9(1), March 2012.  
<http://dx.doi.org/10.1145/2133382.2133384>.
- [J5] Richard Vuduc and Kenneth Czechowski. What GPU computing means for high-end systems. *IEEE Micro*, 31(4):74–78, July/August 2011.  
<http://dx.doi.org/10.1109/MM.2011.78>.

- [J6] Sam Williams, Richard Vuduc, Leonid Oliker, John Shalf, Katherine Yelick, and James Demmel. Optimizing sparse matrix-vector multiply on emerging multicore platforms. *Parallel Computing (ParCo)*, 35(3):178–194, March 2009.  
*Extends conference version:* <http://dx.doi.org/10.1145/1362622.1362674>.  
<http://dx.doi.org/10.1016/j.parco.2008.12.006>.  
**Most Downloaded Paper, Q1 2009:** <http://tinyurl.com/yllkfee>.
- [J7] Rajesh Nishtala, Richard Vuduc, James W. Demmel, and Katherine A. Yelick. When cache blocking sparse matrix vector multiply works and why. *Applicable Algebra in Engineering, Communication, and Computing: Special Issue on Computational Linear Algebra and Sparse Matrix Computations*, March 2007.  
<http://dx.doi.org/10.1007/s00200-007-0038-9>.
- [J8] James Demmel, Jack Dongarra, Viktor Eijkhout, Erika Fuentes, Antoine Petit, Richard Vuduc, R. Clint Whaley, and Katherine Yelick. Self-adapting linear algebra algorithms and software. *Proc. IEEE*, 93(2):293–312, February 2005.  
<http://dx.doi.org/10.1109/JPROC.2004.840848>.
- [J9] Eun-Jin Im, Katherine Yelick, and Richard Vuduc. SPARSITY: Optimization framework for sparse matrix kernels. *Int'l. J. High Performance Computing Applications (IJHPCA)*, 18(1):135–158, February 2004.  
<http://dx.doi.org/10.1177/1094342004041296>.
- [J10] Richard Vuduc, James Demmel, and Jeff Bilmes. Statistical models for empirical search-based performance tuning. *Int'l. J. High Performance Computing Applications (IJHPCA)*, 18(1):65–94, 2004.  
*Extends conference version:* [http://dx.doi.org/10.1007/3-540-45545-0\\_21](http://dx.doi.org/10.1007/3-540-45545-0_21).  
<http://dx.doi.org/10.1177/1094342004041293>.
- [J11] Bohdan Balko, Irvin W. Kay, James D. Silk, Richard Vuduc, and John W. Neuberger. Superfluorescence in the presence of inhomogeneous broadening. *Hyperfine Interactions: Special Issue on the Gamma-Ray Laser*, 107(1–4):369–379, June 1997.  
<http://dx.doi.org/10.1023/A:1012020225589>.
- [J12] Bohdan Balko, Irvin W. Kay, Richard Vuduc, and John W. Neuberger. Recovery of superfluorescence in inhomogeneously broadened systems through rapid relaxation. *Phys. Rev. B*, 55(18):12079–12085, May 1997.  
<http://dx.doi.org/10.1103/PhysRevB.55.12079>.

### 3.3 BOOK CONTRIBUTIONS

- [B1] Jee Choi and Richard Vuduc. A brief history and introduction to GPGPU. In Xuan Shi, Volodymyr Kindratenko, and Chaowei

Yang, editors, *Modern Accelerator Technologies for Geographic Information Science*, pages 9–23, Boston, MA, USA, 2013. Springer.

[http://dx.doi.org/10.1007/978-1-4614-8745-6\\_2](http://dx.doi.org/10.1007/978-1-4614-8745-6_2).

- [B2] Seunghwa Kang, Nitin Arora, Aashay Shringarpure, Richard W. Vuduc, and David A. Bader. Evaluating multicore processors and accelerators for dense numerical computations. In Sanguthevar Rajasekaran, Lance Fiondella, Mohamed Ahmed, and Reda A. Ammar, editors, *Multicore computing: Algorithms, architectures, and applications*. Chapman and Hall/CRC, 2013.
- [B3] Hyesoon Kim, Richard Vuduc, Sara Baghsorkhi, Jee Choi, and Wen mei Hwu. *Performance analysis and tuning for general purpose graphics processing units (GPGPU)*. Synthesis Lectures on Computer Architecture. Morgan & Claypool Publishers, San Rafael, CA, USA, November 2012.
- [B4] Richard W. Vuduc. Autotuning (definition). In David Padua, editor, *Encyclopedia of Parallel Computing*. Springer, 2011.
- [B5] Sam Williams, Nathan Bell, Jee Choi, Michael Garland, Leonid Oliker, and Richard Vuduc. Sparse matrix vector multiplication on multicore and accelerator systems. In Jakub Kurzak, David A. Bader, and Jack Dongarra, editors, *Scientific Computing with Multicore Processors and Accelerators*. CRC Press, 2010.

#### 3.4 CONFERENCE PUBLICATIONS (REFEREED)

- [C1] Jiajia Li, Jee Choi, Ioakeim Perros, Jimeng Sun, and Richard Vuduc. Model-driven sparse CP decomposition for high-order tensors. In *Proceedings of the IEEE Parallel and Distributed Processing Symposium (IPDPS)*, Orlando, FL, USA, May 29–June 2 2017. (to appear). New '16-'17 Item  
Acceptance rate: [23%].
- [C2] Ioakeim Perros, Fei Wang, Ping Zhang, Peter Walker, Richard Vuduc, Jyotishman Pathak, and Jimeng Sun. Polyadic regression and its application to chemogenomics. In *Proceedings of the SIAM International Conference on Data Mining (SDM)*, April 2017. (to appear). New '16-'17 Item
- [C3] Mohammad M. Hossain, Chandra Nath, Tommy M. Tucker, Thomas R. Kurfess, and Richard W. Vuduc. A graphical approach for freeform surface offsetting with GPU acceleration for subtractive 3D printing. In *Proceedings of the 11th ASME Manufacturing Science and Engineering Conference (MSEC)*, Blacksburg, VA, USA, June 2016. New '16-'17 Item
- [C4] Zhengkai Wu, Thomas M. Tucker, Chandra Nath, Thomas R. Kurfess, and Richard W. Vuduc. Step ring based 3D path planning via GPU simulation for subtractive 3D printing. In *Proceedings of the 11th ASME Manufacturing Science and Engineering Conference (MSEC)*, Blacksburg, VA, USA, June 2016. New '16-'17 Item

- [C5] Mohammad Hossain, Tommy Tucker, Thomas Kurfess, and Richard Vuduc. HDT: A hybrid structure for extreme-resolution 3D sparse data modeling. In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, Chicago, IL, USA, May 2016. Acceptance rate: [114/496=23%]. <http://ipdps.org>.
- [C6] Jiajia Li, Casey Battaglini, Ioakeim Perros, Jimeng Sun, and Richard Vuduc. An input-adaptive and in-place dense tensor-times-matrix multiply. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, Austin, TX, USA, November 2015. Acceptance rate: [79/358=22.1%]. <http://dx.doi.org/10.1145/2807591.2807671>.
- [C7] Ioakeim Perros, Robert Chen, Richard Vuduc, and Jimeng Sun. Sparse hierarchical Tucker factorization and its application to healthcare. In *Proc. IEEE Int'l. Conf. Data Mining (ICDM)*, Stony Brook, NY, USA, November 2015. (*short paper*).
- [C8] Oded Green, Marat Dukhan, and Richard Vuduc. Branch-avoiding graph algorithms. In *Proc. ACM Symp. Parallel Algorithms and Architectures (SPAA)*, Portland, OR, USA, June 2015.
- [C9] Yang You, James Demmel, Kenneth Czechowski, Le Song, and Richard Vuduc. CA-SVM: Communication-avoiding support vector machines on clusters. In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, Hyderabad, India, May 2015. **Winner, Best Paper (algorithms track)**. Acceptance rate: [108/496=21.8%]. <http://dx.doi.org/10.1109/IPDPS.2015.117>.
- [C10] Piyush Sao, Xing Liu, Richard Vuduc, and Xiaoye Li. A sparse direct solver for distributed memory Xeon Phi-accelerated systems. In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)*, Hyderabad, India, May 2015. Acceptance rate: [108/496=21.8%]. <http://dx.doi.org/10.1109/IPDPS.2015.104>.
- [C11] Piyush Sao, Richard Vuduc, and Xiaoye Li. A distributed CPU-GPU sparse direct solver. In *Proceedings of the 20th International European Conference on Parallel Processing (Euro-Par)*, Porto, Portugal, August 2014. [http://dx.doi.org/10.1007/978-3-319-09873-9\\_41](http://dx.doi.org/10.1007/978-3-319-09873-9_41).
- [C12] Kenneth Czechowski, Victor W. Lee, Ed Grochowski, Ronny Ronen, Ronak Singhal, Richard Vuduc, and Pradeep Dubey. Improving the energy efficiency of big cores. In *Proc. ACM/IEEE Int'l. Symp. on Computer Architecture (ISCA)*, Minneapolis, MN, USA, June 2014. <http://dx.doi.org/10.1145/2678373.2665743>.

New '16-'17 Item



- [C13] Jee Choi, Marat Dukhan, Xing Liu, and Richard Vuduc. Algorithmic time, energy, and power on candidate HPC compute building blocks. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Phoenix, AZ, USA, May 2014.  
<http://dx.doi.org/10.1109/IPDPS.2014.54>.
- [C14] Piyush Sao and Richard Vuduc. Self-stabilizing iterative solvers. In *Proc. 4th Wkshp. Latest Advances in Scalable Algorithms for Large-scale Systems (ScalA)*, Denver, CO, USA, November 2013.  
<http://dx.doi.org/10.1145/2530268.2530272>.
- [C15] Marat Dukhan and Richard Vuduc. Methods for high-throughput computation of elementary functions. In *Proc. 10th Int'l. Conf. Parallel Processing and Applied Mathematics (PPAM)*, September 2013.
- [C16] Sangmin Park, Mary Jean Harrold, and Richard Vuduc. Griffin: Grouping suspicious memory-access patterns to improve understanding of concurrency bugs. In *Proc. Int'l. Symp. Software Testing and Analysis (ISSTA)*, Lugano, Switzerland, July 2013.  
 Acceptance rate: [32/124=25.8%].
- [C17] Jee Choi, Dan Bedard, Rob Fowler, and Richard Vuduc. A roofline model of energy. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Boston, MA, USA, May 2013.  
*This paper is a short peer-reviewed conference version of the following technical report: <https://smartech.gatech.edu/xmlui/handle/1853/45737>.*  
 Acceptance rate: [106/494=21.5%].  
<http://dx.doi.org/10.1109/IPDPS.2013.77>.
- [C18] Kenneth Czechowski and Richard Vuduc. A theoretical framework for algorithm-architecture co-design. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Boston, MA, USA, May 2013.  
 Acceptance rate: [106/494=21.5%].  
<http://dx.doi.org/10.1109/IPDPS.2013.99>.
- [C19] William B. March, Kenneth Czechowski, Marat Dukhan, Thomas Benson, Dongryeol Lee, Andrew J. Connolly, Richard Vuduc, Edmond Chow, and Alexander G. Gray. Optimizing the computation of n-point correlations on large-scale astronomical data. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, November 2012.  
 Acceptance rate: [100/472=21.2%].  
<http://dl.acm.org/citation.cfm?id=2389097>.
- [C20] Aparna Chandramowliswaran, Jee Whan Choi, Kamesh Madhuri, and Richard Vuduc. Towards a communication optimal fast multipole method and its implications for exascale. In *Proc. ACM Symp. Parallel Algorithms and Architectures (SPAA)*, Pittsburgh, PA, USA, June 2012.  
*Brief announcement.*  
<http://dx.doi.org/10.1145/2312005.2312039>.

- [C21] Kenneth Czechowski, Chris McClanahan, Casey Battaglini, Karthik Iyer, P.-K. Yeung, and Richard Vuduc. On the communication complexity of 3D FFTs and its implications for exascale. In *Proc. ACM Int'l. Conf. Supercomputing (ICS)*, San Servolo Island, Venice, Italy, June 2012.  
Acceptance rate: [36/161=22.4%].  
<http://dx.doi.org/10.1145/2304576.2304604>.
- [C22] Dongryeol Lee, Richard Vuduc, and Alexander G. Gray. A distributed kernel summation framework for general-dimension machine learning. In *Proc. SIAM Int'l. Conf. Data Mining (SDM)*, Anaheim, CA, USA, April 2012.  
**Winner, Best Paper.**  
Acceptance rate: [53 (talks)/363=14.6%].
- [C23] Sangmin Park, Richard Vuduc, and Mary Jean Harrold. A unified approach for localizing non-deadlock concurrency bugs. In *Proc. IEEE Int'l. Conf. Software Testing, Verification, and Validation (ICST)*, Montréal, Canada, April 2012.  
Acceptance rate: [39/145=26.9%].  
<http://dx.doi.org/10.1109/ICST.2012.85>.
- [C24] Cong Hou, George Vulov, Daniel Quinlan, David Jefferson, Richard Fujimoto, and Richard Vuduc. A new method for program inversion. In *Proc. Int'l. Conf. Compiler Construction (CC)*, Tallinn, Estonia, March 2012.  
Acceptance rate: [13/51=25.5%].  
<http://www.cc.gatech.edu/~chou3/ProgramInversion.pdf>.
- [C25] Jaewoong Sim, Aniruddha Dasgputa, Hyesoon Kim, and Richard Vuduc. A performance analysis framework for identifying performance benefits in GPGPU applications. In *Proc. ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP)*, New Orleans, LA, USA, February 2012.  
Acceptance rate: [26/175=14.9%].  
<http://dx.doi.org/10.1145/2145816.2145819>.
- [C26] Sooraj Bhat, Ashish Agarwal, Richard Vuduc, and Alexander Gray. A type theory for probability density functions. In *ACM SIGACT-SIGPLAN Symp. Principles of Programming Languages (POPL 2012)*, Philadelphia, PA, USA, January 2012.  
Acceptance rate: [44/205=21.5%].  
<http://dx.doi.org/10.1145/2103656.2103721>.
- [C27] George Vulov, Cong Hou, Richard Vuduc, Daniel Quinlan, Richard Fujimoto, and David Jefferson. The Backstroke framework for source level reverse computation applied to parallel discrete event simulation. In S. Jain, R. R. Creasey, J. Himmlspach, K.P. White, and M. Fu, editors, *Proc. Winter Simulation Conf. (WSC)*, Phoenix, AZ, USA, December 2011. IEEE.  
<http://www.informs-sim.org/wsc11papers/264.pdf>.
- [C28] Kenneth Czechowski, Chris McClanahan, Casey Battaglini, Karthik Iyer, P.-K. Yeung, and Richard Vuduc. Prospects for scalable 3D FFTs on heterogeneous exascale systems. In *In Proc.*

*ACM/IEEE Conf. Supercomputing (SC)*, November 2011.  
(poster; extended version available as Georgia Tech report GT-CSE-11-02.

- [C29] Jaekyu Lee, Nagesh B. Lakshminarayana, Hyesoon Kim, and Richard Vuduc. Many-thread aware prefetching mechanisms for GPGPU applications. In *Proc. IEEE/ACM Int'l. Symp. Microarchitecture (MICRO)*, Atlanta, GA, USA, December 2010.  
Acceptance rate: [45/248=18.1%].  
<http://dx.doi.org/10.1109/MICRO.2010.44>.
- [C30] Aparna Chandramowliswaran, Kamesh Madduri, and Richard Vuduc. Diagnosis, tuning, and redesign for multicore performance: A case study of the fast multipole method. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, New Orleans, LA, USA, November 2010.  
Acceptance rate: [51/253=20.2%].  
<http://dx.doi.org/10.1109/SC.2010.19>.
- [C31] Abtin Rahimian, Ilya Lashuk, Aparna Chandramowliswaran, Dhairya Malhotra, Logan Moon, Rahul Sampath, Aashay Shringarpure, Shravan Veerapaneni, Jeffrey Vetter, Richard Vuduc, Denis Zorin, and George Biros. Petascale direct numerical simulation of blood flow on 200k cores and heterogeneous architectures. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, New Orleans, LA, USA, November 2010.  
**Winner, Gordon Bell Prize.**  
Acceptance rate: [51/253=20.2%].  
<http://dx.doi.org/10.1109/SC.2010.42>.
- [C32] Sangmin Park, Richard W. Vuduc, and Mary Jean Harold. FALCON: Fault localization for concurrent programs. In *Proc. ACM/IEEE Int'l. Conf. Software Eng., Cape Town, South Africa*, May 2010.  
Acceptance rate: [52/380=13.7%].  
<http://dx.doi.org/10.1145/1806799.1806838>.
- [C33] Aparna Chandramowliswaran, Kathleen Knobe, and Richard Vuduc. Performance evaluation of Concurrent Collections on high-performance multicore computing systems. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA, USA, April 2010.  
**Winner, Best Paper (software track).**  
Acceptance rate: [127/527=24.1%].  
<http://dx.doi.org/10.1109/IPDPS.2010.5470404>.
- [C34] Aparna Chandramowliswaran, Samuel Williams, Leonid Oliker, Ilya Lashuk, George Biros, and Richard Vuduc. Optimizing and tuning the fast multipole method for state-of-the-art multicore architectures. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Atlanta, GA, USA, April 2010.  
Acceptance rate: [127/527=24.1%].  
<http://dx.doi.org/10.1109/IPDPS.2010.5470415>.

- [C35] Jee Whan Choi, Amik Singh, and Richard W. Vuduc. Model-driven autotuning of sparse matrix-vector multiply on GPUs. In *Proc. ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP)*, Bangalore, India, January 2010. Acceptance rate: [29/173=16.8%].  
<http://dx.doi.org/10.1145/1693453.1693471>.
- [C36] Aparna Chandramowliswaran, Kathleen Knobe, and Richard Vuduc. Applying the Concurrent Collections programming model to asynchronous parallel dense linear algebra. In *Proc. ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP)*, Bangalore, India, January 2010. (poster). Acceptance rate: [Papers+posters: 45/173=26.1%].  
<http://dx.doi.org/10.1145/1693453.1693506>.
- [C37] Ilya Lashuk, Aparna Chandramowliswaran, Harper Langston, Tuan-Anh Nguyen, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Ying, Denis Zorin, and George Biros. A massively parallel adaptive fast multipole method on heterogeneous architectures. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, Portland, OR, USA, November 2009. **Finalist, Best Paper.** Acceptance rate: [59/261=22.6%].  
<http://doi.acm.org/10.1145/1654059.1654118>.
- [C38] Nitin Arora, Aashay Shringarpure, and Richard Vuduc. Direct n-body kernels for multicore platforms. In *Proc. Int'l. Conf. Parallel Processing (ICPP)*, Vienna, Austria, September 2009. Acceptance rate: [71/220=32.3%].  
<http://dx.doi.org/10.1109/ICPP.2009.71>.
- [C39] Nitin Arora, Ryan P. Russell, and Richard W. Vuduc. Fast sensitivity computations for numerical optimizations. In *Proc. AAS/AIAA Astrodynamics Specialist Conference*, AAS 09-435, Pittsburgh, PA, USA, August 2009.  
[http://soliton.ae.gatech.edu/people/rrussell/FinalPublications/ConferencePapers/09AugAAS\\_09-392\\_p2pLowthrust.pdf](http://soliton.ae.gatech.edu/people/rrussell/FinalPublications/ConferencePapers/09AugAAS_09-392_p2pLowthrust.pdf).
- [C40] Sundaresan Venkatasubramanian and Richard W. Vuduc. Tuned and wildly asynchronous stencil kernels for hybrid CPU/GPU platforms. In *Proc. ACM Int'l. Conf. Supercomputing (ICS)*, New York, NY, USA, June 2009. Acceptance rate: [47/191=25%].  
<http://dx.doi.org/10.1145/1542275.1542312>.
- [C41] Seunghwa Kang, David Bader, and Richard Vuduc. Understanding the design trade-offs among current multicore systems for numerical computations. In *Proc. IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS)*, Rome, Italy, May 2009. Acceptance rate: [101/440=23.0%].  
<http://doi.ieeecomputersociety.org/10.1109/IPDPS.2009.5161055>.

- [C42] Manisha Gajbe, Andrew Canning, John Shalf, Lin-Wang Wang, Harvey Wasserman, and Richard Vuduc. Auto-tuning distributed-memory 3-dimensional fast Fourier transforms on the Cray XT4. In *Proc. Cray User's Group (CUG) Meeting*, Atlanta, GA, USA, May 2009.  
[http://www.cug.org/5-publications/proceedings\\_attendee\\_lists/CUG09CD/S09\\_Proceedings/pages/authors/11-15Wednesday/14C-Gajbe/GAJBE-paper.pdf](http://www.cug.org/5-publications/proceedings_attendee_lists/CUG09CD/S09_Proceedings/pages/authors/11-15Wednesday/14C-Gajbe/GAJBE-paper.pdf).
- [C43] Sam Williams, Leonid Oliker, Richard Vuduc, John Shalf, Katherine Yelick, and James Demmel. Optimization of sparse matrix-vector multiplication on emerging multicore platforms. In *Proc. ACM/IEEE Conf. Supercomputing (SC)*, 2007.  
 Acceptance rate: [54/268=20.1%].  
<http://dx.doi.org/10.1145/1362622.1362674>.
- [C44] Dan Quinlan, Richard Vuduc, Thomas Panas, Jochen Härdtlein, and Andreas Sæbjørnsen. Support for whole-program analysis and the verification of the one-definition rule in C++. In *Proc. Static Analysis Summit (SAS)*, volume NIST Special Publication 500-262, pages 27–35, 2006.  
[http://samate.nist.gov/docs/NIST\\_Special\\_Publication\\_500-262.pdf](http://samate.nist.gov/docs/NIST_Special_Publication_500-262.pdf).
- [C45] Dan Quinlan, Shmuel Ur, and Richard Vuduc. An extensible open-source compiler infrastructure for testing. In *Proc. IBM Haifa Verification Conf. (VC)*, volume LNCS 3875, pages 116–133, Haifa, Israel, November 2005. Springer Berlin / Heidelberg.  
[http://dx.doi.org/10.1007/11678779\\_9](http://dx.doi.org/10.1007/11678779_9).
- [C46] Richard W. Vuduc and Hyun-Jin Moon. Fast sparse matrix-vector multiplication by exploiting variable block structure. In *Proc. High-Performance Computing and Communications Conf. (HPCC)*, volume LNCS 3726, pages 807–816, Sorrento, Italy, September 2005. Springer.  
 Acceptance rate: [116/387=30%].  
[http://dx.doi.org/10.1007/11557654\\_91](http://dx.doi.org/10.1007/11557654_91).
- [C47] Richard Vuduc, James W. Demmel, and Katherine A. Yelick. OSKI: A library of automatically tuned sparse matrix kernels. In *Proc. SciDAC, J. Physics: Conf. Ser.*, volume 16, pages 521–530, 2005.  
<http://dx.doi.org/10.1088/1742-6596/16/1/071>.
- [C48] Benjamin C. Lee, Richard Vuduc, James Demmel, and Katherine Yelick. Performance models for evaluation and automatic tuning of symmetric sparse matrix-vector multiply. In *Proc. Int'l. Conf. Parallel Processing (ICPP)*, Montreal, Canada, August 2004.  
**Winner, Best Paper.**  
 Acceptance rate: [65/190=34.2%].  
<http://dx.doi.org/10.1109/ICPP.2004.1327917>.
- [C49] Richard Vuduc, James W. Demmel, Katherine A. Yelick, Shoaib Kamil, Rajesh Nishtala, and Benjamin Lee. Performance optimizations and bounds for sparse matrix-vector multiply. In

*Proc. ACM/IEEE Conf. Supercomputing (SC)*, Baltimore, MD, USA, November 2002.

**Finalist, Best Student Paper.**

<http://portal.acm.org/citation.cfm?id=762822>.

- [C50] Richard Vuduc, James W. Demmel, and Jeff A. Bilmes. Statistical models for empirical search-based performance tuning. In *Proc. Int'l. Conf. Computational Science (ICCS)*, volume LNCS 2073, pages 117–126, San Francisco, CA, USA, May 2001. Springer Berlin / Heidelberg.

*Extends workshop version:* <http://www.eecs.harvard.edu/~smith/fddo3/papers/107.ps>.

[http://dx.doi.org/10.1007/3-540-45545-0\\_21](http://dx.doi.org/10.1007/3-540-45545-0_21).

- [C51] Danyel Fisher, Kris Hildrum, Jason Hong, Mark Newman, Megan Thomas, and Richard Vuduc. SWAMI: A framework for collaborative filtering algorithm development and evaluation. In *Proc. ACM Conf. Research and Development in Information Retrieval (SIGIR)*, pages 366–368, Athens, Greece, July 2000. (poster).

<http://dx.doi.org/10.1145/345508.345658>.

- [C52] Bohdan Balko, Irvin Kay, Richard Vuduc, and John Neuberger. An investigation of the possible enhancement of nuclear superfluorescence through crystalline and hyperfine interaction effects. In *Proc. Lasers '95*, page 308, 1996.

### 3:5 WORKSHOP PUBLICATIONS (REFEREED)

- [W1] Jiajia Li, Yuchen Ma, Chenggang Yan, and Richard Vuduc. Optimizing sparse tensor times matrix on multicore and many-core architectures. In *Proceedings of the 6th Workshop on Irregular Applications: Architectures and Algorithms (IA<sup>3</sup>)*, co-located with SC16, Salt Lake City, UT, USA, November 2016.

*New '16-'17 Item*

<http://hpc.pnl.gov/IA3>.

- [W2] Jeffrey Young and Richard Vuduc. Finding balance in the post-Moore's Law era (a position paper). In *Proceedings of the 1st Post-Moore's Era Supercomputing (PMES) Workshop*, co-located with SC16, Salt Lake City, UT, USA, November 2016.

*New '16-'17 Item*

<https://sites.google.com/site/2016pmes/program>.

- [W3] Marat Dukhan, Richard Vuduc, and Jason Riedy. Wanted: Floating-point add round-off error instruction. In *Proceedings of the 2nd International Workshop on Performance Modeling: Methods and Applications (PMAA)*, Frankfurt, Germany, June 2016.

*New '16-'17 Item*

<http://arxiv.org/abs/1603.00491>.

- [W4] Piyush Kumar Sao, Oded Green, Chirag Jain, and Richard Vuduc. A self-correcting connected components algorithm. In *Proceedings of the Fault-Tolerance for HPC at eXtreme Scale (FTXS) Workshop*, Kyoto, Japan, May 2016.

*New '16-'17 Item*

<https://sites.google.com/site/ftxsworkshop/home/ftxs-2016>.

- [W5] Jee W. Choi and Richard W. Vuduc. Analyzing the energy-efficiency of the fast multipole method using a DVFS-aware energy model. In *Proceedings of the Heterogeneous Computing Workshop (HCW), at IPDPS'16*, Chicago, IL, USA, May 2016. New '16-'17 Item  
<http://hcw.eecs.wsu.edu/>.
- [W6] Mohammad M. Hossain, Tommy M. Tucker, Thomas R. Kurfess, and Richard W. Vuduc. A GPU-parallel construction of volumetric trees. In *Proceedings of the 5th Workshop on Irregular Applications: Architectures and Algorithms (IA<sup>3</sup>)*, Austin, TX, USA, November 2015.  
<http://dx.doi.org/10.1145/2833179.2833191>.
- [W7] Casey Battaglini, Robert Pienta, and Richard Vuduc. GraSP: Distributed streaming graph partitioning. In *Proc. 11th Workshop on High-Performance Graph Mining (HPGM), co-located with KDD'15*, Sydney, Australia, August 2015. (to appear).
- [W8] Marat Dukhan, Robert Guthrie, Robertson Taylor, and Richard Vuduc. Furious.js: A model for offloading compute-intensive javascript applications. In Maria J. Garzaran, Samuel Midkiff, and David Padua, editors, *Proceedings of the 1st Workshop on High-Performance Scripting Languages*, San Francisco, CA, USA, February 2015.  
<http://polaris.cs.uiuc.edu/hpsl/>.
- [W9] Jee Choi, Aparna Chandramowlishwaran, Kamesh Madduri, and Richard Vuduc. A CPU-GPU hybrid implementation and model-driven scheduling of the fast multipole method. In *Proc. 7th Wkshp. on General-purpose Processing using GPUs (GPGPU-7)*, Salt Lake City, UT, USA, March 2014. ACM.  
<http://doi.acm.org/10.1145/2576779.2576787>.
- [W10] Piyush Sao and Richard Vuduc. Self-stabilizing iterative solvers. In *Proc. 4th Wkshp. Latest Advances in Scalable Algorithms for Large-scale Systems (ScalA)*, Denver, CO, USA, November 2013.  
<http://dx.doi.org/10.1145/2530268.2530272>.
- [W11] Cong Hou, Daniel Quinlan, David Jefferson, Richard Fujimoto, and Richard Vuduc. Synthesizing loops for program inversion. In *Proc. 4th Wkshp. Reversible Computation*, Copenhagen, Denmark, July 2012. Acceptance rate: [23/46=50%].  
[http://dx.doi.org/10.1007/978-3-642-36315-3\\_6](http://dx.doi.org/10.1007/978-3-642-36315-3_6).
- [W12] Richard Vuduc, Kenneth Czechowski, Aparna Chandramowlishwaran, and Jee Whan Choi. Courses in high-performance computing for scientists and engineers. In *Proc. NSF/TCPP Wkshp. Parallel and Distributed Computing Education (EduPar), co-located with IPDPS'12*, Shanghai, China, May 2012.

- [W13] Raghul Gunasekaran, David Dillow, Galen Shipman, Richard Vuduc, and Edmond Chow. Characterizing application runtime behavior from system logs and metrics. In *Proc. Int'l. Wkshp. Characterizing Applications for Heterogeneous Exascale Systems (CACHES)*, Tucson, AZ, USA, June 2011.
- [W14] Kenneth Czechowski, Casey Battaglini, Chris McClanahan, Aparna Chandramowlishwaran, and Richard Vuduc. Balance principles for algorithm-architecture co-design. In *Proc. USENIX Wkshp. Hot Topics in Parallelism (HotPar)*, Berkeley, CA, USA, May 2011.  
Acceptance rate: [Talks: 16/45=35.5%].  
[http://www.usenix.org/events/hotpar11/tech/final\\_files/Czechowski.pdf](http://www.usenix.org/events/hotpar11/tech/final_files/Czechowski.pdf).
- [W15] Richard Vuduc, Aparna Chandramowlishwaran, Jee Whan Choi, Murat Efe Guney, and Aashay Shringarpure. On the limits of GPU acceleration. In *Proc. USENIX Wkshp. Hot Topics in Parallelism (HotPar)*, Berkeley, CA, USA, June 2010.  
Acceptance rate: [Talks: 16/68=23.5%].
- [W16] Sooraj Bhat, Ashish Agarwal, Alexander Gray, and Richard Vuduc. Toward interactive statistical modeling. *Procedia Computer Science*, 1(1):1829–1838, May–June 2010.  
*Proc. Int'l. Conf. Computational Science (ICCS), Wkshp. Automated Program Generation for Computational Science (APGCS)*.  
<http://dx.doi.org/10.1016/j.procs.2010.04.205>.  
Acceptance rate: [10/21=47.6%].
- [W17] Chunhua Liao, Daniel J. Quinlan, Richard Vuduc, and Thomas Panas. Effective source-to-source outlining to support whole program empirical optimization. In *Proc. Int'l. Wkshp. Languages and Compilers for Parallel Computing (LCPC)*, volume LNCS, Newark, DE, USA, October 2009.  
[http://dx.doi.org/10.1007/978-3-642-13374-9\\_21](http://dx.doi.org/10.1007/978-3-642-13374-9_21).
- [W18] Aparna Chandramowlishwaran, Abhinav Karhu, Ketan Umare, and Richard Vuduc. Numerical algorithms with tunable parallelism. In *Proc. Wkshp. Software Tools for Multicore Systems (STMCS), at IEEE/ACM Int'l. Symp. Code Generation and Optimization (CGO)*, Boston, MA, USA, April 2008.  
<http://people.csail.mit.edu/rabbah/conferences/08/cgo/stmcs/papers/vuduc-stmcs08.pdf>.
- [W19] Thomas Panas, Dan Quinlan, and Richard Vuduc. Analyzing and visualizing whole program architectures. In *Proc. Wkshp. Aerospace Software Engineering (AeroSE), at ACM/IEEE Int'l. Conf. Software Eng. (ICSE)*, Minneapolis, MN, USA, May 2007.  
*Also: Lawrence Livermore National Laboratory Technical Report UCRL-PROC-231453*.  
<http://www.osti.gov/bridge/servlets/purl/909924-c8K5TR/909924.pdf>.



- [W20] Thomas Panas, Dan Quinlan, and Richard Vuduc. Tool support for inspecting the code quality of HPC applications. In *Proc. Wkshp. Software Eng. for High-Performance Computing Applications (SE-HPC), at ACM/IEEE Int'l. Conf. Software Eng. (ICSE)*, Minneapolis, MN, USA, May 2007.  
<http://dx.doi.org/10.1109/SE-HPC.2007.8>.
- [W21] Dan Quinlan, Richard Vuduc, and Ghassan Misherghi. Techniques for specifying bug patterns. In *Proc. ACM Wkshp. Parallel and Distributed Systems: Testing and Debugging (PADTAD), at Int'l. Symp. Software Testing and Analysis (ISSTA)*, Portland, ME, USA, July 2007.  
**Winner, Best Paper.**  
<http://doi.acm.org/10.1145/1273647.1273654>.
- [W22] Qing Yi, Keith Seymour, Haihang You, Richard Vuduc, and Dan Quinlan. POET: Parameterized Optimizations for Empirical Tuning. In *Proc. Wkshp. Performance Optimization of High-level Languages and Libraries (POHLL), at IEEE Int'l. Par. Distrib. Processing Symp. (IPDPS)*, pages 1–8, Long Beach, CA, USA, March 2007.  
<http://dx.doi.org/10.1109/IPDPS.2007.370637>.
- [W23] Dan Quinlan, Markus Schordan, Richard Vuduc, and Qing Yi. Annotating user-defined abstractions for optimization. In *Proc. Wkshp. Performance Optimization of High-level Languages and Libraries (POHLL), at IEEE Int'l. Par. Distrib. Processing Symp. (IPDPS)*, Rhodes, Greece, April 2006.  
<http://dx.doi.org/10.1109/IPDPS.2006.1639722>.
- [W24] Richard Vuduc, Martin Schulz, Dan Quinlan, and Bronis de Supinski. Improving distributed memory applications testing by message perturbation. In *Proc. ACM Wkshp. Parallel and Distributed Systems: Testing and Debugging (PADTAD), at Int'l. Symp. Software Testing and Analysis (ISSTA)*, Portland, ME, USA, July 2006.  
**Winner, Best Paper.**  
<http://dx.doi.org/10.1145/1147403.1147409>.
- [W25] Richard Vuduc, Attila Gyulassy, James W. Demmel, and Katherine A. Yelick. Memory hierarchy optimizations and bounds for sparse  $A^T Ax$ . In *Proc. Wkshp. Parallel Linear Algebra (PLA), at Int'l. Conf. Computational Sci. (ICCS)*, volume LNCS 2659, pages 705–714, Melbourne, Australia, June 2003. Springer Berlin / Heidelberg.  
[http://dx.doi.org/10.1007/3-540-44863-2\\_69](http://dx.doi.org/10.1007/3-540-44863-2_69).
- [W26] Richard Vuduc, Shoaib Kamil, Jen Hsu, Rajesh Nishtala, James W. Demmel, and Katherine A. Yelick. Automatic performance tuning and analysis of sparse triangular solve. In *Proc. Wkshp. Performance Optimization of High-level Languages and Libraries (POHLL), at ACM Int'l. Conf. Supercomputing (ICS)*, New York, USA, June 2002.

**Winner, Best Presentation; Winner, Best Student Paper.**

<http://www.ece.lsu.edu/jxr/pohl1-02/papers/vuduc.pdf>.

- [W27] Richard Vuduc, James Demmel, and Jeff Bilmes. Statistical modeling of feedback data in an automatic tuning system. In *Proc. ACM Wkshp. Feedback-Directed Dynamic Optimization (FDDO), at Int'l. Symp. Microarchitecture (MICRO)*, Monterey, CA, USA, December 2000.

**Winner, Best Presentation.**

<http://www.eecs.harvard.edu/~smith/fddo3/papers/107.ps>.

- [W28] Richard Vuduc and James W. Demmel. Code generators for automatic tuning of numerical kernels: Experiences with FFTW. In *Proc. Semantics, Applications, and Implementation of Program Generation (SAIG), at ACM SIGPLAN Int'l. Conf. Functional Programming (ICFP)*, Montréal, Canada, September 2000.

[http://dx.doi.org/10.1007/3-540-45350-4\\_14](http://dx.doi.org/10.1007/3-540-45350-4_14).

## 3.6 OTHER PUBLICATIONS (NON-REFEREED)

- [O1] Ioakeim Perros, Evangelos E. Papalexakis, Fei Wang, Richard Vuduc, Elizabeth Searles, Michael Thompson, and Jimeng Sun. SPARTan: Scalable PARAFAC<sub>2</sub> for large and sparse data, March 2017.

*New '16-'17 Item*

[arXiv:1703.04219](https://arxiv.org/abs/1703.04219).

- [O2] Ioakeim Perros, Robert Chen, Richard Vuduc, and Jimeng Sun. Sparse hierarchical Tucker factorization and its application to healthcare. Technical Report arXiv:1610.07722, October 2016.

*New '16-'17 Item*

*Extended version of a conference short paper.*

<https://arxiv.org/abs/1610.07722>.

- [O3] Marat Dukhan, Richard Vuduc, and Jason Riedy. Wanted: Floating-point add round-off error instruction. arXiv:1603.00491, March 2016.

*New '16-'17 Item*

<http://arxiv.org/abs/1603.00491>.

- [O4] Yuan Zhao, Qing Yi, Ken Kennedy, Dan Quinlan, and Richard Vuduc. Parameterizing loop fusion for automated empirical tuning. Technical Report UCRL-TR-217808, Center for Applied Scientific Computing, Lawrence Livermore National Laboratory, California, USA, December 2005.

<http://dx.doi.org/10.2172/890608>.

- [O5] E. Jason Riedy and Richard Vuduc. Microbenchmarking the Tera MTA. <http://vuduc.org/pubs/riedy99-tera-report.pdf>, May 1998.

## 3.7 INVITED KEYNOTES AND TALKS

- [T1] How much time, energy, and power does my algorithm need? **Invited talk** for the Texas A&M University Computer Engineering

- and Systems Group (CESG) Seminar, April 2017. *New '16-'17 Item*  
<http://hpcgarage.org/aggies>.
- [T2] How much time, energy, and power does my algorithm need? **Invited talk** for University of Alabama, Birmingham, Dept. of Computer and Information Sciences Seminar, September 2016. *New '16-'17 Item*  
<http://hpcgarage.org/uab>.
- [T3] How much time, energy, and power does my algorithm need? **Invited keynote** at the International Symposium on Memory Systems (MEMSYS, memsys.io), October 2016. *New '16-'17 Item*  
<http://hpcgarage.org/memsys16>.
- [T4] High-speed data analysis through specialization. **Panelist**, HPC "Power Users," Georgia Tech HPC External Advisory Group Meeting, May 2016. *New '16-'17 Item*  
<http://hpcgarage.org/eag>.
- [T5] How much time, energy, and power does my algorithm need? **Invited talk** at the University of California, Irvine, April 2016. *New '16-'17 Item*  
<http://hpcgarage.org/uci>.
- [T6] How much time, energy, and power does my algorithm need? **Invited talk** at the University of Texas at Austin, March 2016. *New '16-'17 Item*  
<http://hpcgarage.org/longhorns>.
- [T7] Performance understanding. **Invited talk** at SPPEXA'16, January 2016. *New '16-'17 Item*  
<http://hpcgarage.org/sppexa16>.
- [T8] Is there life after Moore? **Invited keynote** at Post-Moore Computing Workshop in Japan, December 2015.  
<http://hpcgarage.org/jppm15/>.
- [T9] On algorithmic time, energy, and power. **Invited keynote** at the 11th Workshop on High-Performance, Power-Aware Computing (HPPAC), at IPDPS'15, March 2015.  
<http://hpcgarage.org/ipdps15>.
- [T10] Computer science aspects of the fast multipole method. **Featured Minisymposium Talk** at the SIAM Meeting on Computational Science and Engineering (CSE), March 2015.  
<http://hpcgarage.org/cse15>.
- [T11] A roofline model of energy. Platform for Advanced Scientific Computing (PASC) meeting, June 2014.  
<http://hpcgarage.org/pasc14/>.
- [T12] (position talk) execution under a power constraint is about optimal control. **Invited panelist** at the High-Performance, Power-Aware Computing (HPPAC) Workshop at IPDPS'14, May 2014.  
<http://hpcgarage.org/hppac14/>.
- [T13] On the time, energy, and power to execute an algorithm. **Invited keynote** at the SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP), February 2014.  
<http://www.siam.org/meetings/pp14/>.

- [T14] Performance engineering practice. Invited talk at the IEEE VIS Workshop on Visualization and Analysis of Performance of Large-scale Software, October 14 2013.  
<http://hpcgarage.org/vapls13>.  
<http://www.sci.utah.edu/vapls2013>.
- [T15] Generalized roofline analysis? Dagstuhl Seminar 13401: Automatic application autotuning for HPC architectures, September 30–October 4 2013.  
<http://hpcgarage.org/13401>; [http://drops.dagstuhl.de/opus/volltexte/2014/4423/pdf/dagrep\\_v003\\_i009\\_p214\\_s13401.pdf](http://drops.dagstuhl.de/opus/volltexte/2014/4423/pdf/dagrep_v003_i009_p214_s13401.pdf).  
<http://www.dagstuhl.de/en/program/calendar/semhp/?semnr=13401>.
- [T16] How much (execution) time, energy, and power will my algorithm cost? **Invited keynote** at the Int'l. Conf. Parallel Processing and Applied Mathematics (PPAM), September 8–11 2013.  
<http://hpcgarage.org/ppam13>.  
<http://ppam.pl/>.
- [T17] Generalized roofline analysis. Invited talk at ModSim: the US Department of Energy Workshop on Modeling and Simulation of Exascale Systems and Applications, September 18–19 2013.  
<http://hpcgarage.org/modsim13>.  
<http://hpc.pnl.gov/modsim/2013/>.
- [T18] Can (your) algorithms inform architectures? Invited talk at Examath: The US Department of Energy Applied Mathematics Research for Exascale Computing, August 2013.  
<http://hpcgarage.org/examath13/>.  
<https://collab.mcs.anl.gov/display/examath>.
- [T19] What do first principles of algorithms and architectures say about hybrid systems? **Invited keynote** at the 3rd Int'l. Wkshp. Accelerators and Hybrid Exascale Systems (AsHES), May 2013.  
<http://hpcgarage.org/ashes2013/>.  
<http://www.mcs.anl.gov/events/workshops/ashes/2013>.
- [T20] A theory for co-designing algorithms and architectures under power and chip-area constraints. **Invited keynote** at the 10th Int'l. Mtg. on High-Performance Computing for Computational Science (VECPAR), Kobe, Japan., July 17–20 2012.  
<http://nkl.cc.u-tokyo.ac.jp/VECPAR2012>.
- [T21] A theory for co-designing algorithms and architectures under power and chip-area constraints. Invited talk at the Young and Bright HPC Researchers session, International Supercomputing Conference (ISC), Hamburg, Germany, June 17–21 2012.  
<http://www.isc-events.com/isc12/>.
- [T22] Will exascale computing *really* require new algorithms and programming models? **Invited panelist** at the IEEE Int'l. Parallel and Distributed Processing Symposium (IPDPS), Shanghai, China, May 2012.  
<http://ipdps.org>.

- [T23] How might algorithms inform architectures at exascale? **Invited keynote** at the Scalable Hierarchical Algorithms for eXtreme Computing (SHAX-C) Workshop, King Abdullah University of Science and Technology (KAUST), Saudi Arabia, April 28–30 2012.  
<http://vuduc.org/talks/2012-SHAX-C/>.
- [T24] A theory of co-design? **Invited keynote** at the Partnership for Advanced Computing in Europe (PRACE) Future Technologies Workshop, Dansbury, UK, April 11 2012.  
<http://vuduc.org/talks/2012-PRACE/>.
- [T25] Principles of algorithm-architecture co-design. Invited talk at the Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Providence, RI, USA, January 9–13 2012.  
<http://icerm.brown.edu/tw12-1-exascale>.
- [T26] Balance principles for algorithm-architecture co-design. ECE Seminar, Carnegie Mellon University, October 27 2011.
- [T27] Balance principles for algorithm-architecture co-design. **Invited keynote** at Facing the Multicore Challenge II: A Conference for Young Scientists, September 28–30 2011.  
<http://www.multicore-challenge.org/>.
- [T28] State-of-the-art and future directions in autotuning. **Invited keynote** at the 9th Int'l. Conf. Parallel Processing and Applied Mathematics (PPAM), Toruń, Poland, September 11–14 2011.  
<http://ppam.pl>.
- [T29] CnC for HPC. Int'l. Conf. Industrial and Applied Mathematics (ICIAM), Minisymposium on Creating the Next Generation of High Performance Numerical Computing Capabilities, Vancouver, BC, Canada, July 2011.  
[http://meetings.siam.org/sess/dsp\\_programsess.cfm?SESSIONCODE=12156](http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=12156).
- [T30] Performance and correctness of software for large-scale heterogeneous systems. **Invited keynote** at the Wkshp. Exploiting Concurrency Efficiently and Correctly (EC<sup>2</sup>), July 14–15 2011.  
<http://www.cse.psu.edu/~swarat/ec2/>.
- [T31] Performance principles and practice. Invited talk at the Int'l. Supercomputing Conference (ISC), Hamburg, Germany, June 19–23 2011.  
<http://www.supercomp.de/isc11>.
- [T32] Parallel performance analysis principles and practice. Invited talk at the Parallel Algorithms, Programming, Architectures (PAPA) Workshop, at the Design Automation Conference (DAC), June 5 2011.  
<http://papaworkshop.com>.

- [T33] Performance principles and practice. Supercomputing Interest Community Seminar, IBM TJ Watson Laboratory, Yorktown Heights, NY, USA, May 6 2011.
- [T34] Performance principles and practice. **Invited talk** at the Salishan Conference on High-Speed Computing, sponsored by the US Dept. of Energy, Gleneden, OR, USA, April 25–28 2011.  
<http://www.lanl.gov/orgs/hpc/salishan/>.
- [T35] Performance engineering of a petascale blood flow simulator. Invited seminar at the University of California, Berkeley, April 21 2011.
- [T36] Performance principles and practice. Invited talk at the Wkshp. High-Performance Computing and Emerging Architectures, Institute for Mathematics and Its Applications at the University of Minnesota, organized by L.A. Barba, E. Darve, D. Keyes, January 10–14 2011.  
<http://www.ima.umn.edu/2010-2011/W1.10-14.11/> – *Talk cancelled due to weather.*
- [T37] Should I port my code to a GPU? Scientific Computing and Numerics (SCAN) Seminar, organized by D. Bindel and A. Vladimirsky, Cornell University, November 8 2010.  
<http://www.math.cornell.edu/~scan/index-f10.html>.
- [T38] Opportunities and challenges in GPU co-processing. National Science Foundation Workshop on Accelerators for Data-Intensive Applications, organized by V. Prasanna and D. Bader, October 13 2010.
- [T39] On the opportunities and limits of GPU co-processing. Invited talk at the 2nd NSF Wkshp. Frontiers of Multicore Computing (FMC-II), organized by S. Zhou, Y. Yesha, and M. Halem, at the University of Maryland, Baltimore County, September 22–23 2010.  
<http://www.mc2.umbc.edu/workshops/fmc2.php>.
- [T40] Should I port my code to a GPU? Invited talk at the Clusters, Clouds, and Grids for Scientific Computing (CCGSC), organized by J. Dongarra and B. Tourancheau, Flat Rock, NC, USA, September 7–10 2010.  
<http://web.eecs.utk.edu/~dongarra/ccgsc2010/>.
- [T41] On the limits of and opportunities for GPU acceleration. Invited talk at the Scientific Discovery through Advanced Computing (SciDAC), US Department of Energy, Chattanooga, Tennessee, July 13 2010.  
<http://computing.ornl.gov/workshops/scidac2010>.
- [T42] Generalized n-body problems: From fast algorithms to fast code. Dagstuhl Seminar 10191 on Program Composition and Optimization: Autotuning, Scheduling, Metaprogramming and Beyond, May 2010.

<http://www.dagstuhl.de/en/program/calendar/semhp/?semnr=10191>.

- [T43] Optimizing and tuning the fast multipole method for state-of-the-art multicore architectures. SIAM Conf. Parallel Processing (SIAM PP), Seattle, WA, USA, February 2010.  
<http://www.siam.org/meetings/pp10/>.
- [T44] Parallel n-body solvers: Lessons learned in the multicore/many-core era. Yahoo! Labs, Bangalore, India, January 2010.
- [T45] Parallel n-body solvers: Lessons learned in the multicore/many-core era. NIPS Wkshp. Large-scale Machine Learning: Parallelism and Massive Datasets, <http://www.select.cs.cmu.edu/meetings/biglearn09/>, Vancouver, British Columbia, Canada, December 2009.
- [T46] Toward scalable particle methods for physics and data analysis. Wkshp. Performance Analysis on Extreme-Scale Systems and Applications, at the Los Alamos Computer Science Symposium (LACSS), Santa Fe, NM, USA, October 2009.  
<http://www.lanl.gov/conferences/lacss/2009/agenda/workshops.shtml>.
- [T47] Toward a programming model for data analysis and mining. Minisymposium on The Potential of Computational Algorithms in Datamining, at the SIAM Conf. Computational Sci. Eng. (SIAM CSE), Miami, FL, USA, March 2009.  
[http://meetings.siam.org/sess/dsp\\_programsess.cfm?SESSIONCODE=8103](http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=8103).
- [T48] Recent progress in autotuning. Intel Corporation, Hudson, MA, USA, August 2008.
- [T49] Expressing data structure transformations for an automatically tuned sparse matrix library. Lua Workshop, George Washington University, Washington, DC, USA, July 2008.  
<http://www.lua.org/wshop08.html#vuduc>.
- [T50] Tuning sparse matrix-vector multiply for multicore. Courant Institute, New York University, USA, April 2008.
- [T51] Tuning sparse matrix-vector multiply for multicore. Oak Ridge National Laboratory, Oak Ridge, TN, USA, April 2008.
- [T52] Tuning sparse matrix-vector multiply for multicore. Minisymposium on Algorithms and Optimizations Targeting Multi-Core Architectures, SIAM Conf. Parallel Processing (SIAM PP), Atlanta, GA, USA, March 2008.  
[http://meetings.siam.org/sess/dsp\\_programsess.cfm?SESSIONCODE=6762](http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=6762).
- [T53] Automated data structure transformations for sparse matrix kernels. Minisymposium on Tools for the Development of High-performance Scientific Applications, SIAM Conf. Parallel

Processing (SIAM PP), Atlanta, GA, USA, March 2008.  
[http://meetings.siam.org/sess/dsp\\_programsess.cfm?SESSIONCODE=6765](http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=6765).

- [T54] OSKI: A library of automatically tuned sparse matrix kernels. **Invited keynote** at the Int'l. Wkshp. Automatic Performance Tuning (iWAPT), Tōkyō, Japan, October 2006.  
<http://iwapt.org/2006/>.
- [T55] OSKI: A library of automatically tuned sparse matrix kernels. Kyōtō University, Japan, October 2006.
- [T56] Automatically tuned sparse matrix kernels. High-Performance Computing Seminar, Pomona College, USA, September 2006.
- [T57] The Optimized Sparse Kernel Interface. Bay Area Scientific Computing Day, Livermore, CA, USA, March 2006.  
<https://computation.llnl.gov/casc/workshops/bascd/2006/>.
- [T58] Tutorial: The ROSE source-to-source infrastructure. IEEE Int'l. Conf. Parallel Architecture and Compilation Techniques (PACT), St. Louis, MO, USA, September 2005.  
<http://www.informatik.uni-trier.de/~ley/db/conf/IEEEpact/IEEEpact2005.html>.
- [T59] Automatically tuned sparse matrix kernels. University of Rome, Tor Vegata, Italy, July 2005.

### 3.8 RESEARCH PROPOSALS AND GRANTS — PRINCIPAL INVESTIGATOR (PI) OR CO-PI

#### 3.8.1 *Approved and Funded*

1. PFI:BIC: NEXT GENERATION REAL-TIME DISTRIBUTED MANUFACTURING SERVICE SYSTEMS USING DIGITAL PROCESS PLANNING AND GPU-ACCELERATED PARALLEL COMPUTING *New '16-'17 Item*  
 PI: Thomas Kurfess (ME)  
 Co-PIs: Francis Durso (Psychology), Christopher Saldana (ME), Cassandra Telenko (ME), Richard Vuduc  
 National Science Foundation, *Award 1631803*  
 September 2016–August 2019  
 Awarded: \$1 million
2. EAGER-DYNAMICDATA: POWER AWARE DATA DRIVEN DISTRIBUTED SIMULATION ON MICRO-CLUSTER PLATFORMS  
 PI: Richard Fujimoto  
 Co-PIs: Richard Vuduc, Michael Hunter (CEE)  
 National Science Foundation, *EAGER-DynamicData, Award 1462503*  
 September 2015  
 Requested: \$300,000 over 2 years; Awarded: \$240,000 over 2 years
3. EAGER: SCALING UP MACHINE LEARNING WITH VIRTUAL MEMORY



- PI: Polo Chau  
 Co-PIs: Richard Vuduc  
 National Science Foundation, [Award 1551614](#)  
 September 2015  
 Requested: \$184,904 over 1 year; Awarded: \$184,904 1 year
4. XPS: FULL: DSD: A PARALLEL TENSOR INFRASTRUCTURE (PARTI!) FOR DATA ANALYSIS  
 PI: Richard Vuduc  
 Co-PI: Jimeng Sun  
 National Science Foundation, [Exploiting Parallelism and Scalability \(XPS\)](#), [Award 1533768](#)  
 August 2015  
 Requested: \$1 million over 4 years; Awarded: \$750,000 over 4 years
5. COLLABORATIVE RESEARCH: EMBRACE: EVOLVABLE METHODS FOR BENCHMARKING REALISM THROUGH APPLICATION AND COMMUNITY ENGAGEMENT  
 PI: David A. Bader & Jack Dongarra (UTK)  
 Co-PIs: E. J. Riedy, Richard Vuduc, Piotr Luszczek (UTK)  
 National Science Foundation, [Benchmarks of Realistic Scientific Application Performance \(BRAP\) of Large-scale Computing Systems](#), [Award 1535058](#)  
 August 2015  
 Requested: \$500,000 over 2 years; Awarded: \$250,000 over 2 years
6. SHF: SMALL: HOW MUCH EXECUTION TIME, ENERGY, AND POWER DOES AN ALGORITHM NEED?  
 PI: Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 1422935](#)  
 June 2014–May 2017
7. VANCOUVER2: VANCOUVER2: IMPROVING PROGRAMMABILITY OF CONTEMPORARY HETEROGENEOUS ARCHITECTURES  
 PI: Jeffrey Vetter (CoC/CSE + ORNL)  
 Co-PIs: Wen-Mei Hwu (University of Illinois, Urbana-Champaign), Allen Maloney (University of Oregon), Richard Vuduc (CoC/CSE)  
 Department of Energy, X-Stack  
 June 2014–May 2017
8. SI2-SSI: COLLABORATIVE: THE XSCALA PROJECT: A COMMUNITY REPOSITORY FOR MODEL-DRIVEN DESIGN AND TUNING OF DATA-INTENSIVE APPLICATIONS FOR EXTREME-SCALE ACCELERATOR-BASED SYSTEMS  
 PI: David A. Bader (CoC/CSE)  
 Co-PIs: Viktor Prasanna (University of Southern California), Edward J. Riedy (CoC/CSE), Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 1339745](#)  
 October 2013–September 2016

9. XPS:CLCCA: OPTIMIZING HETEROGENEOUS PLATFORMS FOR UN-STRUCTURED PARALLELISM  
 PI: Sudha Yalamanchili (CoE/ECE)  
 Co-PIs: Hyesoon Kim (CoC/CS), Richard VUduc (CoC/CSE)  
 National Science Foundation, [Award 1337177](#)  
 September 2013–August 2016
  
10. CPS: SYNERGY: CONVERTING MULTI-AXIS MACHINE TOOLS INTO SUB-TRACTIVE 3D PRINTERS BY USING INTELLIGENT DISCRETE GEOMETRY DATA STRUCTURES DESIGNED FOR PARALLEL AND DISTRIBUTED COMPUTING  
 PI: Thomas Kurfess (CoE/ME)  
 Co-PI: Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 1329742](#)  
 September 2013–August 2016
  
11. A NEW THEORY OF ALGORITHM-ARCHITECTURE CO-DESIGN  
 PI: Richard Vuduc  
 Defense Advanced Research Projects Agency, [DARPA-BAA-11-34](#) (I2O Office-wide)  
 Computer Science Study Group, Phase 3 option  
 December 2012–December 2014
  
12. CCF: SHF: SMALL: LOCALIZATION AND EXPLANATION OF FAULTS IN CONCURRENT SOFTWARE  
 PI: Mary Jean Harrold (CoC/CS)  
 Co-PI: Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 1116210](#)  
 July 2011–June 2014
  
13. COMPILER-SUPPORT FOR REVERSE COMPUTATION  
 PI: Richard Vuduc (CoC/CSE)  
 Lawrence Livermore National Laboratory  
 January 2011–May 2011
  
14. TOWARD EXASCALE PSEUDO-SPECTRAL CODES FOR TURBULENCE SIMULATIONS ON GPGPUS  
 PI: Richard Vuduc (CoC/CSE)  
 Co-PI: P.K. Yeung (CoE/AE)  
 Georgia Institute of Technology, Institute for Data and HPC Type I Seed Grant Program  
 AY 2010–2011
  
15. MLPACK: SCALABLE MACHINE LEARNING SOFTWARE FOR LARGE-SCALE SCIENCE  
 PI: Alexander Gray  
 Co-PIs: Richard Vuduc, Haesun Park, Yu (Cathy) Jiao, John McDonald, Gordon Richards, Alexander Shapiro, Jeffrey Vetter

Georgia Institute of Technology, Institute for Data and HPC Type  
 II Seed Grant Program  
 AY 2010–2011

16. VANCOUVER: DESIGNING A NEXT-GENERATION SOFTWARE INFRASTRUCTURE FOR HETEROGENEOUS EXASCALE COMPUTING  
 PI: Jeffrey Vetter (CoC/CSE + ORNL)  
 Co-PIs: Wen-Mei Hwu (University of Illinois, Urbana-Champaign), Allen Maloney (University of Oregon), Richard Vuduc (CoC/CSE)  
 Department of Energy, X-Stack  
 September 2010–August 2013
  
17. CAREER: AUTOTUNING FOUNDATIONS FOR EXASCALE SYSTEMS  
 PI: Richard Vuduc  
 National Science Foundation, [Award 0953100](#)  
 June 2010–May 2014
  
18. FOUNDATIONS FOR A HIGH-SPEED, LOW-POWER DATA ANALYTICS APPLIANCE  
 PI: Richard Vuduc  
 Defense Advanced Research Projects Agency  
 Computer Science Study Group, Phase 2  
 June 2010–May 2012
  
19. AUTOTUNING APPLICATIONS FOR EMERGING MULTICORE PLATFORMS  
 PI: Richard Vuduc  
 Co-PI: Chi-Keung Luk (Intel Corporation)  
 2009–2010
  
20. COLLABORATIVE RESEARCH: ESTABLISHING A CENTER FOR HYBRID MULTICORE PRODUCTIVITY RESEARCH  
 PI: David A. Bader (CoC/CSE), Thomas Conte (CoC/CS)  
 Co-PIs: Nathan Clark (CoC/CS), Ada Gavrilovska (CoC/CS), Hyesoon Kim (CoC/CS), Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 0934114](#)  
 August 2009–July 2010
  
21. FROM ALGORITHMS TO HARDWARE: BLUEPRINTS TO SUPPORT CO-OPERATIVE HARDWARE/SOFTWARE PREFETCHING IN DATA-INTENSIVE APPLICATIONS  
 Co-PIs: Hyesoon Kim, Richard Vuduc  
 Raytheon Faculty Fellowship  
 August 2009–May 2010
  
22. ALGORITHMS AND SOFTWARE WITH TUNABLE PARALLELISM  
 PI: Richard Vuduc  
 Defense Advanced Research Projects Agency

Computer Science Study Group (RA-08-52)  
 April 2009–April 2010

23. QAMELEON: HARDWARE/SOFTWARE CO-OPERATIVE AUTOMATED TUNING FOR HETEROGENEOUS ARCHITECTURES  
 PI: Hyesoon Kim (CoC/CS)  
 Co-PI: Richard Vuduc (CoC/CSE)  
 National Science Foundation, joint with Semiconductor Research Corporation, [Award 0903447](#)  
 August 2009–July 2012
  
24. THOR: A NEW PROGRAMMING MODEL FOR DATA ANALYSIS AND MINING  
 PI: Richard Vuduc  
 Co-PI: Alexander G. Gray (CoC/CSE)  
 National Science Foundation, [Award 0833136](#)  
 September 2008–August 2010
  
25. COLLABORATIVE RESEARCH: ESTABLISHING AN I/UCRC CENTER FOR MULTICORE PRODUCTIVITY RESEARCH (CMPR)  
 PI: Milt Halem (University of Maryland, Baltimore County)  
 Co-PIs: David A. Bader (CoC/CSE), Paul Woodward (University of Minnesota), Paul Sheldon (University of California, San Diego)  
 Contributors: Richard Vuduc (CoC/CSE)  
 National Science Foundation, [Award 0831110](#)  
 August 2008

### 3.9 RESEARCH HONORS AND AWARDS

1. May 2015: Winner, Best paper (software track) at the IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS).
2. April 2013: Lockheed Martin Excellence in Teaching Award
3. April 2012: Winner, Best Paper at the SIAM Conference on Data Mining (SDM)
4. November 2010: Winner, Gordon Bell Prize at ACM/IEEE Conf. Supercomputing (SC)
5. April 2010: College of Computing's Outstanding Junior Faculty Research Award
6. April 2010: Winner, Best paper (software track) at the IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS).
7. January 2010: NSF CAREER Awardee.
8. November 2009: Finalist, Best paper at SC
9. November 2009: Winner, R&D 100 Award for ROSE (joint with Lawrence Livermore National Laboratory)

10. April 2009: Panelist, DARPA Computer Science Study Panel (CSSP). One of twelve panelists selected nationally among untenured US citizen professors.
11. July 2006: Winner, Best paper at Parallel and Distributed Testing and Debugging (PADTAD)
12. September 2004: Winner, Best paper at Int'l. Conf. Parallel Processing (ICPP)
13. June 2002: Winner, Best student presentation at Workshop on Performance Optimization of High-level Languages and Libraries, joint with the ACM Int'l. Conf. Supercomputing (ICS)
14. June 2002: Winner, Best student paper at Workshop on Performance Optimization of High-level Languages and Libraries, joint with ICS
15. November 2002: Finalist, Best student paper at SC
16. December 2000: Winner, Best presentation at Workshop on Feedback-directed Dynamic Optimization (FDDO), joint with the IEEE Int'l. Symp. Microarchitecture (MICRO)

## SERVICE

## 4.1 PROFESSIONAL ACTIVITIES

4.1.1 *Membership and Activities in Professional Societies*

1. 2016–2018, Vice Chair (elected), Society for Industrial and Applied Mathematics, Activity Group on Supercomputing (SIAM/SC)
2. 2015–2017, Newsletter Editor, Association of Computing Machinery (ACM) Special Interest Group on High-Performance Computing (ACM SIGHPC)
3. 2010–2012, Secretary (elected), Society for Industrial and Applied Mathematics, Activity Group on Supercomputing (SIAM/SC)
4. Member, ACM
5. Member, SIAM
6. Member, Institute of Electrical and Electronics Engineers (IEEE)
7. Member, USENIX Association

4.1.2 *Journals*

1. Associate Editor, IEEE Transactions on Parallel and Distributed Systems (TPDS), 2015–2017
2. Associate Editor, International Journal of High-Performance Computing Applications (IJHPCA), 2012–present
3. Guest Co-editor, International Journal of High-Performance Computing Applications (IJHPCA), special issue on Autotuning, doi:10.1177/1094342013495303, 2013

4.1.3 *Conference Committee Activities*4.1.3.1 *Conferences*

1. Program Committee, Post-Moore's Era Supercomputing (PMES) Workshop, 2017 *New '16-'17 Item*
2. Program Committee, IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS), Applications track, 2017 *New '16-'17 Item*
3. Ph.D. Forum Committee, Int'l. Supercomputing Conference (ISC), 2017 *New '16-'17 Item*
4. Research Posters Committee, Int'l. Supercomputing Conference (ISC), 2017 *New '16-'17 Item*

5. Program Co-Chair, *IEEE CLUSTER*, 2017 *New '16-'17 Item*
6. Program Committee, Post-Moore's Era Supercomputing (PMES) Workshop, 2016
7. Technical Papers Vice-Chair,<sup>1</sup> *ACM/IEEE Conf. Supercomputing (SC)*, 2016
8. Co-chair, *SIAM Conf. Parallel Processing (SIAM PP)*, 2016
9. Program Committee, International Conference on Parallel Processing (ICPP), 2016
10. Tutorials Co-chair,<sup>2</sup> *ACM/IEEE Conf. Supercomputing (SC)*, 2015
11. General co-chair, *IEEE Int'l. Symposium on Workload Characterization (IISWC)*, 2015
12. Program Committee, *ACM Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, 2015
13. Program Committee Track Chair, *IEEE Cluster*, "Applications, Algorithms, and Performance" track, 2015
14. Program Committee, *IEEE/ACM Symp. on Cluster, Cloud, and Grid Computing (CCGrid)*, Programming Models and Runtime Systems area, 2015
15. Program Committee, *NSF eXtreme Science and Engineering Discovery Environment Conference (XSEDE)*, Technology track, 2014
16. Program Committee, *IEEE/ACM Symp. on Cluster, Cloud, and Grid Computing (CCGrid)*, Doctoral symposium, 2014
17. Program Committee, *ACM/IEEE Conf. Supercomputing (SC)*, Programming systems track, 2014
18. Program Committee, *ACM/IEEE Conf. Supercomputing (SC)*, Workshops track, 2014
19. Program Committee, *ACM/IEEE Conf. Supercomputing (SC)*, Doctoral Showcase, 2014
20. Program Committee, *Int'l. Mtg. High-Performance Computing for Computational Sci. (VECPAR)*, 2014
21. Workshop and Tutorials Committee Co-Chair, *ACM Int'l. Conf. Supercomputing (ICS)*, 2013
22. Program Committee Track Co-Chair, *ACM/IEEE Conf. Supercomputing (SC)*, 2013
23. Program Committee Co-Chair, *ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP)*, 2013

<sup>1</sup> Together with Lois McInnes Curfman (Argonne National Laboratory), we implemented double-blind review for SC'16.

<sup>2</sup> Together with CJ Newburn (then at Intel), we implemented online distribution of tutorial notes for SC'15.

24. Program Committee, Int'l. Green Computing Conference (IGCC), 2013
25. Program Committee, ACM/IEEE Conf. Supercomputing (SC), Performance track, 2012
26. Program Committee, Int'l. Wkshp. Modern Accelerator Technologies for GIScience (MAT4GIScience), 2012
27. Program Committee, Int'l. Conf. Parallel Processing (ICPP), Performance track, 2012
28. Program Committee, IEEE Int'l. Parallel and Distributed Processing Symp. (IPDPS), Algorithms track, 2012
29. PhD Forum Committee, IPDPS, 2012
30. Program Committee, SIAM Conf. Parallel Processing (SIAM PP), 2012
31. Program Committee, Int'l. Conf. High-Performance Computing (HiPC), Software track, 2011
32. Program Committee, Workshop on GPU Computing, at Int'l. Conf. Parallel Processing and Applied Mathematics (PPAM), 2011
33. Program Committee, ACM Student Research Competition and Poster Session at the ACM Int'l. Conf. Supercomputing (ICS), 2011
34. Program Committee, SC, Performance track, 2011
35. Program Committee, IPDPS, Software track, 2011
36. PhD Forum Committee, IPDPS, 2011
37. Program Committee, IEEE/ACM Int'l. Symp. Code Generation and Optimization (CGO), 2011
38. Program Committee, HiPC, 2010
39. Program Committee, SC, Applications track, 2010
40. Program Committee, Conf. Partitioned Global Address Space (PGAS) Programming Models, 2010
41. Program Committee, Int'l. Mtg. High-Performance Computing for Computational Sci. (VECPAR), 2010
42. Program Committee, ACM Int'l. Conf. Computing Frontiers (CF), 2010
43. Program Committee, PPOPP, 2010
44. Program Committee, SC, Applications track, 2009
45. Program Committee, Int'l. Conf. High-Performance Computing (HiPC), 2008
46. Program Committee, IEEE Int'l. Conf. Computational Sci. Eng. (CSE), 2008
47. Poster Committee, SC, 2005



4.1.3.2 *Workshops*

1. Program Co-Chair, The 13th Workshop on High-Performance, Power-Aware Computing (HPPAC), 2017 *New '16-'17 Item*
2. Program Committee, Int'l. Wkshp. Automatic Performance Tuning (iWAPT), 2013–2017 *New '16-'17 Item*
3. Co-organizer, Workshop on Power and Energy Aspects of Computing (PEAC), 2013, 2015
4. Program Chair, Int'l. Wkshp. Automatic Performance Tuning (iWAPT), 2012
5. Program Chair, Concurrent Collections (CnC) Workshop, 2011
6. Program Committee, High-Performance Scientific Software at EuroPar, 2011
7. Program Committee, USENIX Wkshp. Hot Topics in Parallelism (HotPar), 2011
8. Vice Program Chair, iWAPT, 2011
9. Program Committee, International Workshop on Multicore Software Engineering at ACM/IEEE Int'l. Conf. Software Eng., 2011
10. Program Committee, Workshop on Application/Architecture Co-design for Extreme-scale Computing at IEEE Cluster, 2010
11. Organizing Committee, Concurrent Collections Workshop at LCPC, 2010
12. Program Committee, iWAPT, 2010
13. Program Committee, IEEE Int'l. Symp. Workload Characterization (IISWC), 2010
14. Local Organizing Chair, IISWC, 2010
15. Steering Committee, Wkshp. Statistical Machine Learning applied to ARchitecture and compilaTion (SMART), 2010
16. Program Committee, HotPar, 2010
17. Program Committee, iWAPT, 2009
18. Program Committee, SMART, 2008
19. Program Committee, iWAPT, 2008
20. Program Committee, IEEE Int'l. Wkshp. Parallel and Distributed Scientific and Eng. Computing (PDSEC), 2008
21. Program Committee, iWAPT, 2007
22. Program Committee, Wkshp. Performance Optimization of High-level Languages and Libraries (POHLL), 2007
23. Program Committee, SMART, 2007
24. Program Committee, POHLL, 2006

4.1.3.3 *Workshop and External Course Organization*

1. Co-organizer, *Minisymposium on Energy-aware High-Performance Computing*, SIAM Parallel Processing (PP), Feb. 2012
2. Co-organizer, *Wkshp. Libraries and Autotuning for Extreme Scale Systems*, for the US Dept. of Energy Center for Scalable Application Development Software (DOE CScADS), Aug. 2011
3. Co-organizer, Tutorial on Performance analysis and tuning for GPGPUs, at the *IEEE Int'l. Symp. High Performance Computer Architecture (HPCA)*, Feb. 2011
4. Co-organizer, Tutorial on Performance analysis and tuning for GPGPUs, at the *ACM/IEEE Int'l. Symp. Microarchitecture (MICRO)*, Dec. 2010
5. Co-organizer, *Wkshp. Libraries and Autotuning for Petascale Applications*, for US DOE CScADS, Aug. 2010
6. Co-organizer, Tutorial on Performance Analysis and Optimization for GPUs, at NSF TeraGrid Conf., Aug. 2010
7. Co-organizer, *Wkshp. Libraries and Autotuning for Petascale Applications*, for US DOE CScADS, Jul. 2009
8. Co-organizer, *Wkshp. Automatic Tuning for Petascale Systems*, for US DOE CScADS, Aug. 2008
9. Co-organizer, *Minisymposium on Adaptive Tools and Frameworks for High-Performance Numerical Computations*, SIAM PP, Mar. 2006
10. Co-organizer, Tutorial on "ROSE C/C++ Source-to-source Translator," Int'l. Conf. Parallel Architectures and Compilation Techniques (PACT), Sep. 2005

## 4.2 ON-CAMPUS GEORGIA TECH COMMITTEES

1. CSE, Qualifying Exam Committee, CoC, 2008–2017 AY. *New '16-'17 Item*
2. CoC CS Graduate Curriculum Committee, 2015–2017 AY. *New '16-'17 Item*
3. CoC Undergraduate Curriculum Committee, 2015–2017 AY. *New '16-'17 Item*
4. College of Computing Dean Review Committee, 2015.
5. Data Science and Engineering Faculty Council, 2014–2015 AY.
6. CoC Dean's Advisory Committee, 2014–2015 AY.
7. CoC Undergraduate Curriculum Committee, 2014–2015 AY.
8. CETL TA Awards Selection Committee, 2014.
9. Associate Chair for Academic Affairs, CSE, 2013–2015 AY.
10. Director of Graduate Programs, CSE, 2013–2016 AY.
11. Brooks Byers Professorships Committee, 2013–2014 AY.

12. CSE Awards Committee Chair, CoC, 2012–2013 AY.
13. CoC Awards Committee Member, 2012–2013 AY.
14. CoC MOOMS Committee Member, 2012–2013 AY.
15. CSE Chair Search Committee Member, 2012–2013 AY.
16. CSE Seminar Co-organizer, CoC, 2012–2013 AY.
17. CSE School Advisory Committee (SAC), CoC, 2011–2012 AY. Committee, (SAC), CoC, 2011–2012 Academic Year (AY).
18. CSE, Space Planning Committee, CoC, 2011–2012 AY.
19. CSE, Graduate Admissions and Recruiting Committee, CoC, 2010–2011 Academic Year (AY).
20. Undergraduate Curriculum Advisory Committee on Parallel Computing, College of Computing (CoC), 2009–2010 AY.
21. CSE Chair Advisory Committee, CoC, 2009–2010 AY.
22. Computer Science (CS) PhD Recruiting Weekend Committee, CoC, 2008–2009 AY.
23. CSE Review of the Chair Committee, CoC, 2008–2009 AY.
24. CSE Faculty Recruiting Committee (FRC), CoC, 2008–2009 AY.
25. Faculty Computer Committee (FCC), CoC, 2008–2009 AY.
26. CSE PhD Admissions Committee, CoC, 2008–2009 AY.
27. CS PhD Admissions Committee, CoC, 2008–2009 AY.
28. CSE Chair Advisory Committee, CoC, 2008–2009 AY.
29. CSE FRC, CoC, 2008–2009 AY.
30. CSE PhD Admissions Committee, 2007–2008 AY.
31. CS PhD Admissions Committee, 2007–2008 AY.
32. Teaching Assistanceship Requirement Grandfathering Committee, CoC. 2007–2008 AY.
33. FCC, CoC, 2007–2008 AY.
34. Awards Committee, CoC, 2007–2008 AY.

## 4.3 MEMBER OF PH.D. EXAMINING COMMITTEES

1. Xin XING – Advisor: Edmond CHOW  
CSE/Math, Qualifying Exam, Spring 2017 *New '16-'17 Item*
2. Yuanzheng ZHU – Advisor: Cyrus AIDUN  
CoE/ME, Thesis Proposal, Spring 2017 *New '16-'17 Item*
3. Chao SHI – Advisor: John WISE  
CoS/Physics, Thesis Defense, Spring 2017 *New '16-'17 Item*
4. Tony PAN – Advisor: Srinivas ALURU  
CoC/CSE, Thesis Proposal, Spring 2017 *New '16-'17 Item*
5. Lifeng NAI – Advisor: Hyesoon KIM  
CoC/CS, Thesis Defense, Fall 2016 *New '16-'17 Item*
6. Joo Hwan LEE – Advisor: Hyesoon KIM  
CoC/CS, Thesis Defense, Fall 2016 *New '16-'17 Item*
7. Anshuman GOSWAMI – Advisor: Karsten SCHWAN and Matthew WOLF (GT/ORNL)  
CoC/CS, Thesis Defense, Fall 2016 *New '16-'17 Item*
8. Eric ANGER – Advisor: Sudha YALAMANCHILI  
CoE/ECE, Thesis Defense, Fall 2016 *New '16-'17 Item*
9. Jin WANG – Advisor: Sudha YALAMANCHILI  
CoE/ECE, Thesis Defense, Fall 2016 *New '16-'17 Item*
10. Marat DUKHAN – Advisor: Richard VUDUC  
CoC/CS, Thesis Proposal, Fall 2016 *New '16-'17 Item*
11. Caleb ROBINSON – Advisor: Bistra DILKINA  
CoC/CSE, Qualifying Exam, Fall 2016 *New '16-'17 Item*
12. Jordi WOLFSON-POU – Advisor: Edmond CHOW  
CoC/CSE, Qualifying Exam, Fall 2016 *New '16-'17 Item*
13. Rahul NIHALANI – Advisor: Srinivas ALURU  
CoC/CSE, Thesis Proposal, Fall 2016 *New '16-'17 Item*
14. Ankit SRIVASTAVA – Advisor: Srinivas ALURU  
CoC/CSE, Qualifying Exam, Fall 2016 *New '16-'17 Item*
15. Mohammad HOSSAIN – Advisor: Richard VUDUC  
CoC/CS, Thesis Defense, Fall 2016 *New '16-'17 Item*
16. Piyush SAO – Advisor: Richard VUDUC  
CoC/CSE, Thesis Proposal, Fall 2016 *New '16-'17 Item*
17. Philip PECHER – Advisor: Richard FUJIMOTO  
CoE/CSE-ISyE, Thesis Proposal, Fall 2016 *New '16-'17 Item*
18. Syed Minhaj HASSAN – Advisor: Sudha YALAMANCHILI  
CoE/ECE, Thesis Defense, Fall 2016 *New '16-'17 Item*

19. Chris FORSTER – Advisor: Marc SMITH  
CoE/ME, Thesis Defense, Summer 2016
20. Matthew KINSEY – Advisor: Pablo LAGUNA  
CoS/Physics, Thesis Defense, Summer 2016
21. Dipanjan SENGUPTA – Advisor: Karsten SCHWAN / Matthew WOLF  
CoC/CS, Thesis Defense, Summer 2016
22. James FAIRBANKS – Advisor: David BADER  
CoC/CSE, Thesis Defense, Spring 2016
23. Tushar KUMAR – Advisor: Sudha YALAMANCHILI  
CoE/ECE, Thesis Defense, Spring 2016
24. Ramakrishnan (Ramki) KANNAN – Advisor: Haesun PARK  
CoC/CS, Thesis Defense, Spring 2016
25. Haicheng WU – Advisor: Sudha YALAMANCHILI  
CoE/ECE, Thesis Defense, Spring 2016
26. Jai DAYAL – Advisor: Karsten SCHWAN / Matthew WOLF  
CoC/CS, Thesis Proposal, Spring 2016
27. Joo Hwan LEE – Advisor: Hyesoon KIM  
CoC/CS, Thesis Proposal, Spring 2016
28. Anshuman GOSWAMI – Advisor: Karsten SCHWAN / Matthew  
WOLF  
CoC/CS, Thesis Proposal, Spring 2016
29. Jin WANG – Advisor: Sudha YALAMANCHILI  
CoC/ECE, Thesis Proposal, Spring 2016
30. Eric ANGER – Advisor: Sudha YALAMANCHILI  
CoC/ECE, Thesis Proposal, Spring 2016
31. Parsa BANIHASHEMI – Advisor: Kenneth WILL  
CoE/CEE, Thesis Defense, Fall 2015
32. Naila FAROOQUI – Advisor: Karsten SCHWAN  
CoC/CS, Thesis Defense, Fall 2015
33. Brian RAILING – Advisor: Tom CONTE  
CoC/CS, Thesis Defense, Fall 2015
34. Ryan CURTIN – Advisor: Mark CLEMENTS  
CoE/ECE, Thesis Defense, Summer 2015
35. Aaron HOWELL – Advisor: Cyrus AIDUN  
CoE/ME, Thesis Defense, Spring 2015
36. Indranil ROY – Advisor: Srinivas ALURU  
CoC/CSE, Thesis Defense, Spring 2015
37. Jee Whan CHOI – Advisor: Richard VUDUC  
CoE/ECE, Thesis Defense, Spring 2015

38. Xing LIU – Advisor: Edmond CHOW  
CoC/CSE, Thesis Defense, Fall 2014
39. Naila FAROOQUI – Advisor: Karsten SCHWAN  
CoC/CS, Thesis Proposal, Fall 2014
40. Parsa BANIHASHEMI – Advisor: Kenneth WILL  
CoE/CEE, Thesis Proposal, Fall 2014
41. Nagesh B. LAKSHMINARAYANA – Advisor: Hyesoon KIM  
CoE/ECE, Thesis Defense, Fall 2014
42. Sangmin PARK – Advisor: Mary Jean HARROLD & Richard VUDUC  
CoC/CS, Thesis Defense, Summer 2014
43. Kaushik RAVICHANDRAN – Advisor: Santosh PANDE  
CoC/CS, Thesis Defense, Summer 2014
44. Indranil ROY – Advisor: Srinivas ALURU  
CoC/CSE, Thesis Proposal, Spring 2014
45. Kartik IYER – Advisor: P.-K. YEUNG  
CoC/AE, Thesis Defense, Spring 2014
46. Seongcheol BAEK – Advisor: Jongman KIM  
CoE/ECE, Thesis Defense, Spring 2014
47. Vipin SACHDEVA – Advisor: David BADER  
CoC/CSE, Thesis Proposal, Spring 2014
48. Zhaoming YIN – Advisor: David BADER  
CoC/CSE, Thesis Defense, Spring 2014
49. Xing LIU – Advisor: Edmond CHOW  
CoC/CSE, Thesis Proposal, Spring 2014
50. Oded GREEN – Advisor: David BADER  
CoC/CSE, Thesis Defense, Spring 2014
51. Fang ZHENG – Advisor: Karsten SCHWAN  
CoC/CS, Thesis Defense, Spring 2014
52. Yu TOMITA – Advisor: Ken BROWN  
CoS/CSE-CHEM, Thesis Defense, Spring 2014
53. Ryan CURTIN – Advisor: Alex GRAY  
CoE/ECE, Thesis Proposal, Spring 2014
54. Aaron HOWELL, College of Engineering, School of Mechanical Engineering  
Thesis Proposal, Fall 2013  
Advisor: Cyrus AIDUN (CoC/ME)
55. Philip PECHER, College of Engineering, School of Industrial and Systems Engineering  
Qualifying Exam (CSE-ISyE), Fall 2013  
Advisor: Richard FUJIMOTO

56. Aftab PATEL, College of Computing, School of Computational Science and Engineering  
Qualifying Exam, Fall 2013  
Advisor: Edmond CHOW
57. Lluís MUNGUÍA, College of Computing, School of Computational Science and Engineering  
Qualifying Exam, Fall 2013  
Advisor: David A. BADER
58. Jane KANG, College of Engineering, School of Mechanical Engineering  
Thesis Proposal, Fall 2013  
Advisor: Cyrus AIDUN
59. Junghee LEE, College of Engineering, School of Electrical and Computer Engineering  
Thesis Proposal, Fall 2013  
Advisor: Jongman KIM
60. James FAIRBANKS, College of Computing, School of Computational Science and Engineering  
Qualifying Exam, Fall 2013  
Advisor: David A. BADER
61. Nagesh LAKSHMINARAYANA, College of Computing, School of Computer Science  
Thesis Proposal, Fall 2013  
Advisor: Hyesoon KIM (CoC/CS)
62. Hana STRAKOVA, University of Vienna  
Thesis Defense, Fall 2013  
Advisor: Wilfried GANSTERER
63. Fang ZHENG, College of Computing, School of Computer Science  
Thesis Defense, Summer 2013  
Advisor: Karsten SCHWAN (CoC/CSE)
64. William MARCH, CoC, CSE  
Thesis Defense, Spring 2013  
Advisor: Alexander GRAY (CoC/CSE)
65. Ryan RIEGEL, College of Computing, School of Computational Science and Engineering  
Thesis Defense, Spring 2013  
Advisor: Alexander GRAY (CoC/CSE)
66. Chris FORSTER, College of Engineering, School of Mechanical Engineering  
Thesis Proposal, Spring 2013  
Advisor: Marc SMITH (CoE/ME)
67. Kaushik RAVICHANDRAN, College of Computing, School of Computer Science  
Thesis Proposal, Spring 2013  
Advisor: Santosh PANDE (CoC/CSE)

68. Zhaoming YIN, College of Computing, School of Computational Science and Engineering  
Thesis Proposal, Spring 2013  
Advisor: David BADER (CoC/CSE)
69. Da KUANG, College of Computing, School of Computational Science and Engineering  
Thesis Proposal, Spring 2013  
Advisor: Haesun PARK (CoC/CSE)
70. Aparna CHANDRAMOWLISHWARAN, College of Engineering, School of Electrical and Computer Engineering  
Thesis Defense, Spring 2013  
Advisor: Richard VUDUC (CoC/CSE)
71. Cong HOU, College of Engineering, School of Electrical and Computer Engineering  
Thesis Defense, Spring 2013  
Advisor: Richard VUDUC (CoC/CSE)
72. Oded GREEN, College of Computing, School of Computational Science and Engineering  
Thesis Proposal, Spring 2013  
Advisor: David BADER (CoC/CSE)
73. David EDIGER, College of Engineering, School of Electrical and Computer Engineering  
Thesis Defense, Spring 2013  
Advisor: David BADER (CoC/CSE)
74. Sooraj BHAT, College of Computing, School of Computer Science  
Thesis Defense, Spring 2013  
Advisor: Alexander G. GRAY (CoC/CSE)
75. Nan DU, College of Computing, School of Computational Science and Engineering (CSE)  
Qualifying Exam, Spring 2013  
Advisor: Le SONG (CoC/CSE)
76. Marat DUKHAN, College of Computing, School of Computational Science and Engineering (CSE)  
Qualifying Exam, Spring 2013  
Advisor: Richard VUDUC (CoC/CSE)
77. Anita ZAKRZEWSKA, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: David A. BADER (CoC/CSE)
78. Kartik IYER, College of Engineering (CoE), Aerospace Engineering (AE)  
Thesis Proposal, Fall 2012  
Advisor: P.-K. YEUNG (CoE/AE)
79. Ying LI, College of Computing, Computational Science and Engineering (CSE)



- Thesis Defense, Fall 2012  
Advisor: Richard FUJIMOTO (CoC/CSE)
80. Sunpyo HONG, CoE, Electrical and Computer Engineering (ECE)  
Thesis Defense, Fall 2012  
Advisor: Hyesoon KIM (CoC/CS)
81. Dongryeol LEE, CoC/CSE  
Thesis Defense, Spring 2012  
Advisor: Alexander GRAY (CoC/CSE)
82. Abtin RAHIMIAN, CoC, CSE  
Thesis Defense, Spring 2012  
Advisor: George BIROS (CoC/CSE; UT Austin)
83. Oded GREEN, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: David A. BADER (CoC/CSE)
84. Oguz KAYA, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: Edmond CHOW (CoC/CSE)
85. Kenneth CZECHOWSKI, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: Richard VUDUC (CoC/CSE)
86. Raghul GUNASEKARAN, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: Richard VUDUC (CoC/CSE)
87. Liangda LI, CoC, CSE  
Qualifying Exam, Spring 2012  
Advisor: Haesun PARK (CoC/CSE)
88. Nitin ARORA, College of Engineering (CoE), Aerospace Engineering (AE)  
Thesis Defense, Fall 2011  
Advisor: Ryan RUSSELL (CoE/AE)
89. Bo XIAO, CoC, CSE  
Qualifying Exam, Fall 2011  
Advisor: George BIROS (CoC/CSE + CoC/Biomedical Engineering (BME))
90. Sangho LEE, CoC, Computer Science (CS)  
Qualifying Exam, Fall 2011  
Advisor: Santosh PANDE (CoC/CS)
91. Kaushik RAVICHANDRAN, CoC, CS  
Qualifying Exam, Fall 2011  
Advisor: Santosh PANDE (CoC/CS)
92. Jingfang LIU, College of Science, Mathematics  
Qualifying Exam, Fall 2011  
Advisor: Haomin ZHOU (CoS/Math)

93. Cong HOU, CoC, CS  
Qualifying Exam, Summer 2011  
Advisor: Richard VUDUC (CoC/CSE)
94. Asif SALAHUDDIN, CoE, Mechanical Engineering (ME)  
Thesis Proposal, Summer 2009  
Thesis Defense, Summer 2011  
Advisor: Cyrus AIDUN (CoC/ME)
95. Jaswanth SREERAM, CoC, CS  
Thesis Proposal, Spring 2011  
Advisor: Santosh PANDE (CoC/CS)
96. Abtin RAHIMIAN, CoC, CSE  
Thesis Proposal, Spring 2011  
Advisor: George BIROS (CoC/CSE + CoE/BME)
97. Pushkar PANDE, CoC, CSE  
Qualifying Exam, Spring 2011  
Advisor: David BADER (CoC/CSE)
98. Xing LIU, CoC, CSE  
Qualifying Exam, Spring 2011  
Advisor: David BADER (CoC/CSE)
99. George VULOV, CoC, CSE  
Qualifying Exam, Spring 2011  
Advisor: Richard FUJIMOTO (CoC/CSE), Richard VUDUC (co-advisor, CoC/CSE)
100. Sangmin PARK, CoC, CS  
Qualifying Exam, Fall 2010  
Advisor: Mary Jean HARROLD (CoC/CS), Richard VUDUC (co-advisor, CoC/CSE)
101. Jiang BIAN, CoC, CSE  
Thesis Proposal, Spring 2010  
Advisor: Hongyuan ZHA (CoC/CSE)
102. Dongryeol LEE, CoC, CSE  
Thesis Proposal, Spring 2010  
Advisor: Alexander GRAY (CoC/CSE)
103. Sooraj BHAT, CoC, CS  
Thesis Proposal, Spring 2010  
Advisor: Alexander GRAY (CoC/CSE)
104. William MARCH, CoC, CSE  
Qualifying Exam, Spring 2010  
Advisor: Alexander GRAY (CoC/CSE)
105. Murat Efe GUNEY, CoE, Civil Engineering (CE)  
Thesis Proposal, Summer 2009  
Thesis Defense, Spring 2010  
Advisor: Kenneth WILLS (CoE/CE)

106. Aparna CHANDRAMOWLISHWARAN, CoC, CSE  
Qualifying Exam, Fall 2009  
Advisor: Richard VUDUC (CoC/CSE)
107. Mingxuan SUN, CoC, CS  
Qualifying Exam, Fall 2009  
Advisor: Guy LEBANON
108. Parikshit RAM, CoC, CS  
Qualifying Exam, Fall 2009  
Advisor: Alexander GRAY
109. Virat AGARWAL, CoC, CSE  
Thesis Proposal, Summer 2009  
Advisor: David BADER
110. Rahul SAMPATH, CoC, CSE  
Spring 2009  
Ph.D. Thesis: A parallel geometric multigrid method for finite elements on octrees applied to elastic image registration  
Advisor: George BIROS (CoC/CSE + CoE/BME)
111. Steven P. CRAIN, CoC, CSE  
Qualifying Exam, Spring 2009  
Advisor: Hongyuan ZHA (CoC/CSE)
112. Haw-Jing "Michael" LO, CoE, ECE  
Spring 2009  
Ph.D. Thesis: Design of a reusable distributed arithmetic filter and its application to the affine projection algorithm  
Advisor: David ANDERSON (CoE/ECE)
113. Jaegul CHOO, CoC, CSE  
Qualifying Exam, Spring 2009  
Advisor: Haesun PARK (CoC/CSE)
114. Rahul SAMPATH, CoC, CSE  
Thesis Proposal, Spring 2009  
Advisor: George BIROS (CoC/CSE + CoE/BME)
115. Manisha GAJBE, CoC, CS  
Qualifying Exam, Spring 2009  
Advisor: David BADER (CoC/CSE)
116. Hasan ABBASI, CoC, CS  
Thesis Proposal, Spring 2009  
Advisor: Karsten SCHWAN (CoC/CS)
117. Dongreol LEE, CoC, CS  
Qualifying Exam, Fall 2008  
Advisor: Alexander GRAY (CoC/CSE)
118. Ryan RIEGEL, CoC, CS  
Qualifying Exam, Spring 2008  
Advisor: Alexander GRAY (CoC/CSE)

119. Alfred PARK, CoC, CS  
Ph.D. Thesis: Master/worker parallel discrete event simulation  
Advisor: Richard FUJIMOTO (CoC/CSE)
120. Kamesh MADDURI, CoC, CS  
Ph.D. Thesis: A high-performance framework for analyzing massive complex networks  
Advisor: David BADER (CoC/CSE)
121. Michael P. HOLMES, CoC, CS  
Ph.D. Thesis: Multi-tree Monte Carlo methods for fast, scalable machine learning  
Advisors: Charles ISBELL (primary; CoC/IC), Alexander GRAY (CoC/CSE)

## 4.4 MEMBER OF PH.D. EXAMINING COMMITTEES (EXTERNAL)

1. Oguz KAYA – Advisors: Yves ROBERT and Bora UCAR  
ENS-Lyon, Thesis Defense, Fall 2017 *New '16-'17 Item*
2. Richard VERAS – Advisor: Franz FRANCHETTI  
Carnegie Mellon University / ECE, Thesis Defense, Summer 2017 *New '16-'17 Item*
3. Victoria Caparros CABEZAS – Advisor: Markus PÜSCHEL  
ETH Zürich, Thesis Defense, Fall 2016 *New '16-'17 Item*
4. Richard VERAS – Advisor: Franz FRANCHETTI  
Carnegie Mellon University / ECE, Thesis Proposal, Spring 2016
5. Dimitar LUKARSKI  
Mathematics, Karlsruhe Institute of Technology (KIT)  
Spring 2012  
Thesis: Parallel sparse linear algebra for multi-core and many-core platforms  
Advisor: Jan-Philipp Weiß (KIT)

## 4.5 MEMBER OF MASTERS EXAMINING COMMITTEES

1. Daniel R. BROWNE, CoE, AE  
Summer 2011  
Thesis: Enabling collaborative behaviors among CubeSats  
Advisor: Ryan RUSSELL (CoE/AE)
2. Sundaresan Venkatasubramanian, CoC, CS  
Spring 2009  
Thesis: Tuned and wildly asynchronous algorithms for hybrid CPU/GPU platforms  
Advisor: Richard VUDUC
3. Rick Quax, CoC, CS  
Fall 2008  
Thesis: Modeling and simulating the propagation of infectious diseases using complex networks  
Advisor: David BADER

4. Amrita Mathuriya, CoC, CS  
Fall 2008  
Thesis: GTfold: A scalable multicore code for RNA secondary prediction  
Advisor: David BADER

#### 4.6 RESEARCH PROJECT REVIEWER

1. The Netherlands Organisation for Scientific Research (NWO), Technology Foundation STW, 2016 *New '16-'17 Item*
2. Inria (French National Institute for Computer Science and Applied Mathematics), 2016 *New '16-'17 Item*
3. Department of Energy, 2016
4. National Science Foundation, 2016
5. Department of Energy, 2015, 2016
6. National Science Foundation, 2015
7. Department of Energy, 2014
8. National Science Foundation, 2014
9. National Science Foundation, 2013
10. Department of Energy, 2012
11. National Science Foundation, 2012
12. National Science Foundation, 2011
13. Department of Energy, 2010
14. Department of Energy, 2009
15. National Science Foundation, 2008

#### 4.7 OTHER REVIEWING ACTIVITIES

1. Reviewer for the ACM SIGHPC / Intel Fellowships in Computational and Data Science, 2016–2017 *New '16-'17 Item*

#### 4.8 CIVIC AND OTHER ACTIVITIES

1. Judge, Georgia Science and Engineering Fair, 2013
2. Judge, Georgia Science and Engineering Fair, 2011
3. Judge, Georgia Science and Engineering Fair, 2010
4. Judge, Georgia Science and Engineering Fair, 2009
5. Speaker, Advice on Preparing a Research Statement, CoC Job Hunting Seminar, 2009

6. Reader, Georgia Junior Humanities and Science Fair, 2008
7. Speaker, Advice on Preparing a Research Statement, CoC Job Hunting Seminar, 2008

## PROFESSIONAL RECOGNITION

1. Invited participant, US National Academy of Engineering Frontiers of Engineering (US NAE-FOE) Symposium, September 2015

## 5.1 INVITED CONFERENCE SESSION CHAIRMANSHIPS

1. Session Co-Chair, Autotuning Minisymposium at the Int'l. Conf. Parallel Processing and Applied Mathematics (PPAM), September 2011
2. Session Chair, Panel on Unconventional Wisdom in Multicore (at IPDPS), Atlanta, GA, April 2010
3. Session Co-Chair, Workshop on Parallel Matrix Algorithms and Applications (PMAA), Basel, Switzerland, June 2010
4. Session Chair, Symposium on Computing Systems and Technologies, Georgia Institute of Technology, Atlanta, GA, April 2008
5. Session Co-Chair, Minisymposium on Adaptive Tools and Frameworks for High Performance Numerical Computations, SIAM Parallel Processing, 2006

## 5.2 INVITED PANEL SPEAKER

1. Panel on Career Networking for the SC16 Early Career Program, 2016 *New '16-'17 Item*
2. Panel on Career Networking for the SC15 Early Career Program, 2015
3. Panel on High-Performance Power-Aware Computing (HPPAC) at IPDPS, Phoenix, AZ, USA, May 2014
4. Birds-of-a-Feather Session on Community MOOCs for Computing Technologies and Applications, at SC, Denver, CO, USA, November 2013
5. Panel on Algorithms at IPDPS, Shanghai, China, May 2012
6. Panel on Communication and Synchronization Primitives, US Dept. of Energy (DOE), Advanced Scientific Computing Research (ASCR), Workshop on Exascale Programming Challenges, July 2011.
7. Panel on AMD Fusion-like Processors in HPC, AMD Fusion Developers' Summit, June 2011.

8. Panel on MPI+Manycore Issues and Plans, Sandia National Laboratories Computer Science Research Institute (CSRI) Workshop on Next-generation Scalable Application: When MPI-only is Not Enough, May 2008.
9. Panel on New HPC-Challenge Benchmark Candidates, Georgia Tech, November 2008.

### 5.3 REVIEWER WORK FOR TECHNICAL PUBLICATIONS

#### 5.3.1 *Books and book proposals*

1. MIT Press, 2015. *New '16-'17 Item*
2. CRC Press, 2008, 2010–2014, 2016–2017.
3. John Wiley & Sons, 2013. *New '16-'17 Item*

#### 5.3.2 *Journals*

1. ACM Transactions on Parallel Computing (TOPC), 2013, 2014.
2. International Journal on High Performance Computing Applications (IJHPCA), 2002, 2004, 2009, 2011, 2013, 2014.
3. SIAM J. Scientific Computing (SISC), 2008, 2009, 2011, 2012, 2014, 2015, 2016. *New '16-'17 Item*
4. IEEE Trans. Par. Distrib. Sys. (TPDS), 2009, 2010, 2011, 2012.
5. ACM Trans. Architecture and Code Optimization (ACM TACO), 2009, 2012.
6. J. Parallel Computing (ParCo), 2008, 2009.
7. ACM Trans. Mathematical Software (ACM-TOMS), 2008.
8. J. Parallel and Distributed Computing (JPDC), 2008, 2010.
9. Software: Practice and Experience, 2008.
10. Concurrency and Computation: Practice and Experience (CC:PE), 2007.
11. Parallel Processing Letters, 2004.
12. Proc. IEEE, 2004.
13. J. Functional Programming (JFP), 2001.

#### 5.3.3 *Conferences and Workshops*

1. Innovative Parallel Computing Conference (InPar), 2012
2. ACM SIGPLAN Symp. Principles and Practice of Parallel Programming (PPoPP), 2011, 2012



3. IEEE/ACM Int'l. Symp. Microarchitecture (MICRO), 2011
4. IEEE Int'l. Par. Distrib. Processing Symp. (IPDPS), 2010.
5. Workshop on General-Purpose Computation on Graphics Processing Units (GPGPU), 2009, 2010.
6. Winter Simulation Conference (WSC), 2009.
7. Int'l. Symp. Computer Architecture (ISCA), 2008.
8. Computing Frontiers (CF), 2008.
9. Int'l Conf. High-Performance Computing and Communications (HPCC), 2007.
10. ACM/IEEE Conf. Supercomputing (SC), 2007.
11. ACM Int'l. Conf. Supercomputing (ICS), 2007.
12. Network and Parallel Computing (NPC), 2006.
13. Euro-Par, 2006.
14. Combinatorial Scientific Computing, 2005.
15. ACM Symposium on Parallel Algorithms and Architectures (SPAA), 2003, 2004.
16. ACM Conf. Programming Language Design and Implementation (PLDI), 2003.
17. Int'l. Conf. Computational Science (ICCS), 2001.
18. ACM Conf. Principles of Programming Languages (POPL), 2000.