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Research Interest

Enhancing the productivity of programmers. In particular, design and implementation of domain-specific languages, compiler optimization, desktop grids, object-oriented languages, software engineering tools, and embedded systems programming tools.

Current Research

Model-driven search-based optimization algorithms for tensor contraction expressions. Design of a domain-specific language for quantum chemistry. Language support for mobile computation. Scheduling of applications on a desktop grid using mobile agents. Extensions of Java with retroactive abstraction, multimethods, and closures. Language and debugging support for object protocols. Design of the object-oriented language Brew based on core Java with support for functional programming and design patterns. A virtual testbed for embedded systems programming.

Educational Background

Ph.D. in Computer Science, Dept. of Computer Sciences, Purdue University, Aug. 1996.
Title: *Modularization Constructs for Functional and Object-Oriented Languages.*
Advisor: Vincent F. Russo.

M.S. in Computer Science, Dept. of Computer Sciences, Purdue University, Dec. 1992.

International Summer School on Constructive Methods in Computing Science, Marktoberdorf, Germany, organized by NATO Advanced Study Institute, Aug. 1988.

Dipl.-Ing. (equiv. to M.S. with thesis option) with honors in Computer Science, Dept. of Mathematics and Dept. of Computer Science, University of Linz, Austria, May 1988.

Professional Experience

since 8/11	Associate professor, Louisiana State University.
8/05–8/11	Assistant professor, Louisiana State University.
8/04–8/05	Visiting assistant professor, Louisiana State University.
9/97–6/04	Assistant professor, The Ohio State University.
8/96–8/97	Visiting assistant professor, Purdue University.
5/94–8/96	Research assistant, Purdue University.
6/93–8/93	Software engineer, IBM Watson Research Center, Yorktown Heights, NY.
8/89–5/94	Teaching assistant, Purdue University.
3/89–6/89	Instructor, University of Linz, Austria.
1/89–4/89	Systems programmer, RISC-Linz, University of Linz, Austria.
7/87–12/88	Research assistant, RISC-Linz, University of Linz, Austria.
9/86	Hardware and software consultant, CIFEG Ges.m.b.H., Linz, Austria.
3/86–7/86	Teaching assistant, University of Linz, Austria.
7/85, 7/84	Software engineer, Lenzing AG and VOEST ALPINE AG, Austria.
10/82–5/83	Military service, Austria.

Funding

Baumgartner, G., 1998. *Designing an Object-Oriented Language to Better Support Real-World Programming*, Ohio State University Seed Grant, $18,000, Jan.–Dec. 1998.

Baumgartner, G., 1999. *Design of Language Mechanisms for Mobile Computation*, Undergraduate Research Opportunities Program, Ohio State University, $4,000, Oct. 1999.

Sadayappan, P., Baumgartner, G., Pitzer, R.M., Ramanujam, J., *ITR/AP: High-Performance Algorithms for Electronic Structure Calculations*, NSF Information Technology Research Program, $1,950,900, Sep. 2001–Sep. 2007.

Baumgartner, G., Keyhani, A., *A Virtual Embedded Systems Testbed for Instruction and Design*, NSF CCLI Educational Materials Development, $75,000, Jan.–Dec. 2002.

Keyhani, A., Baumgartner, G., *A Virtual Embedded Systems Testbed for Instruction and Design*, Microsoft Corporation, $49,255, Mar. 2002.

Keyhani, A., Baumgartner, G., *A Virtual Embedded Systems Testbed for Instruction and Design*, Texas Instruments, $7,980, Mar. 2002.

Keyhani, A., Baumgartner, G., *A Virtual Embedded Systems Testbed for Instruction and Design*, Microsoft Corporation, approx. $25,000, Dec. 2002.

Baumgartner, G., *Symmetry Support for the Optimizing Tensor Contraction Engine*, Subcontract to The Ohio State University for NSF ITR/AP Grant, $89,126, Aug. 2004–Sep. 2007.

Sadayappan, P., Ramanujam, J., Baumgartner, G., Harrison, R.J., Bernholdt, D.E., Nieplocha, J., *CSR-AES: An Integrated Framework for Compile-time/Run-time Support for Multi-Scale Applications on High-End Systems*, NSF, $708,000, LSU share: $147,500, Sep. 2005–Aug. 2009.

Baumgartner, G., Ramanujam, J., *Search-Based Model-Driven Framework for Compiler Optimizations*, NSF, $300,000, Apr. 2006–Apr. 2011.

Baumgartner, G., *Embedded Systems Software Development and Testing using a Virtual Testbed*, LSU Council on Research, $5,000, Jul. 2006.

Baumgartner, G., Ramanujam, J., *II-NEW: Research Software Infrastructure for Tensor Computations*, NSF, $300,000, June 2011–May 2015.

Koppelman, D.M., Baumgartner, G., Brylinski, M. Jarrell, M., Moreno, J., *SI2-SSI: A Framework For Monte Carlo Programs Facilitating Low-Friction Collaboration and Performance Retention Through Accelerator Generations*, NSF, $2,158,363, Jan. 2015–Dec. 2017, pending.

Publications and Reports

The publications are listed in the same order as in the LSU PS-36 document.

Book Chapters

[1] Chakravarti, A.J., Baumgartner, G., Lauria, M., "The Organic Grid: Self-Organizing Computational Biology on Desktop Grids." In Albert Zomaya (ed.): *Parallel Computing for Bioinformatics and Computational Biology: Models, Enabling Technologies, and Case Studies*, John Wiley & Sons, February 2006, ISBN 978-0-471-71848-2, Chapter 27, pp. 671-703.

[2] Chakravarti, A.J., Baumgartner, G., Lauria, M., "Self-Organizing Scheduling on the Organic Grid." In Manish Parashar, Salim Hariri (eds.): *Autonomic Computing: Concepts, Infrastructure, and Applications*, CRC Press, 2007, ISBN 978-0-8493-9367-9, Chapter 19, pp. 389–411.

Journal Publications

[3] Baumgartner, G., Russo, V.F., "Signatures: A Language Extension for Improving Type Abstraction and Subtype Polymorphism in C++." *Software—Practice & Experience*, Vol. 25, No. 8, August 1995, pp. 863–889.

[4] Baumgartner, G., Russo, V.F., "Implementing Signatures for C++." *ACM Transactions on Programming Languages and Systems*, Vol. 19, No. 1, January 1997, pp. 153–187.

[5] Läufer, K., Baumgartner, G., Russo, V.F., "Safe Structural Conformance for Java." *Computer Journal*, Vol. 43, No. 6, 2000, pp. 469–481.

[6] Keyhani, A., Marwali, M.N., Higuera, L.E., Athalye, G., Baumgartner, G., "An Integrated Virtual Learning System for the Development of Motor Drive Systems." *IEEE Transactions on Power Systems*, Vol. 17, No. 1, February 2002, pp. 1–6.

[7] Baumgartner, G., Auer, A., Bernholdt, D.E., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hirata, S., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., Sibiryakov, A., "Synthesis of High-Performance Parallel Programs for a Class of Ab Initio Quantum Chemistry Models." *Proceedings of the IEEE*, Vol. 93, No. 2, February 2005, pp. 276–292.

[8] Chakravarti, A.J., Baumgartner, G., Lauria, M., "The Organic Grid: Self-Organizing Computation on a Peer-to-Peer Network." *IEEE Transactions on Systems, Man, and Cybernetics*, Part A, Vol. 35, No. 3, May 2005, pp. 373–384.

[9] Chakravarti, A.J., Baumgartner, G., Lauria, M., "Self-Organizing Scheduling on the Organic Grid." *International Journal on High-Performance Computing Applications*, Vol. 20, No. 1, January 2006, pp. 115–130.

[10] Auer, A., Baumgartner, G., Bernholdt, D.E., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hartono, A., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., Sibiryakov, A., "Automatic Code Generation for Many-Body Electronic Structure Methods: The Tensor Contraction Engine." *Molecular Physics*, Vol. 104, No. 2, January 2006, pp. 211–228.

[11] Krishnamoorthy, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., "Efficient Parallel Out-of-Core Matrix Transposition." *International Journal on High Performance Computing and Networking*, Vol. 2, No. 2/3/4, 2006, pp. 110–119.

[12] Krishnan, S., Krishnamoorthy, S., Baumgartner, G., Lam, C., Ramanujam, J., Sadayappan, P., Choppella, V., "Efficient Synthesis of Out-of-Core Algorithms Using a Nonlinear Optimization Solver." *Journal of Parallel and Distributed Computing*, Vol. 66, No. 5, May 2006, pp. 659–673.

[13] Krishnamoorthy, S., Baumgartner, G., Lam, C., Nieplocha, J., Sadayappan, P., "Layout Transformation Support for the Disk Resident Arrays Framework," *Journal of Supercomputing*, Vol. 36, No. 2, May 2006, pp. 153–170.

[14] Gao, X., Krishnamoorthy, S., Sahoo, S.K., Lam, C., Baumgartner, G., Ramanujam, J., Sadayappan, P., "Efficient Search-Space Pruning for Integrated Fusion and Tiling Transformations." *Concurrency and Computation: Practice and Experience*, Vol. 19, No. 18, December 2007, pp. 2425–2443.

[15] Hartono, A., Lu, Q., Henretty, T., Krishnamoorthy, S., Zhang, H., Baumgartner, G., Bernholdt, D.E., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., "Performance Optimization of Tensor Contraction Expressions for Many-Body Methods in Quantum Chemistry." *Journal of Physical Chemistry A*, Vol. 113, No. 45, September 2009, pp. 12715–12723.

[16] Lam, C., Rauber, T., Baumgartner, G., Cociorva, D., Sadayappan, P., "Memory-Optimal Evaluation of Expression Trees Involving Large Objects." *Computer Languages, Systems & Structures*, Vol. 37, No. 2, July 2011, pp. 63–75, doi: 10.1016/j.cl.2010.09.003.

[17] Lu, Q., Gao, X., Krishnamoorthy, S., Baumgartner, G., Ramanujam, J., Sadayappan, P., "Empirical Performance Model-Driven Data Layout Optimization and Library Call Selection for Tensor Contraction Expressions." *Journal of Parallel and Distributed Computing*, Vol. 72, No. 3, March 2012, pp. 338–352, doi: 10.1016/j.jpdc.2011.09.006.

Conference Publications

[18] Baumgartner, G., Russo, V.F., "Implementing Signatures for C++." In *Proceedings of the 1994 USENIX C++ Conference*, 11–14 April 1994, Cambridge, Massachusetts. USENIX Association, pp. 37–56.

[19] Lam, C., Cociorva, D., Baumgartner, G., Sadayappan, P., "Optimization of Memory Usage Requirement for a Class of Loops Implementing Multi-Dimensional Integrals." In Larry Carter, Jeanne Ferrante (eds.): *Proceedings of the Twelfth International Workshop on Languages and Compilers for Parallel Computing (LCPC '99)*, La Jolla, California, 4–6 August 1999. Lecture Notes in Computer Science, Vol. 1863, Springer-Verlag, pp. 350–364.

[20] Lam, C., Cociorva, D., Baumgartner, G., Sadayappan, P., "Memory-Optimal Evaluation of Expression Trees Involving Large Objects." In *Proceedings of the 1999 International Conference on High Performance Computing (HiPC '99)*, Calcutta, India, 17–20 December 1999. IEEE Computer Society. Lecture Notes in Computer Science, Vol. 1745, Springer-Verlag, pp. 103–110.

[21] Butkevich, S., Renedo, M., Baumgartner, G., Young, M., "Compiler and Tool Support for Debugging Object Protocols." In *Proceedings of the 8th International Symposium on the Foundations of Software Engineering (FSE-8/ACM SIGSoft 2000)*, San Diego, California, 6–10 November 2000, pp. 50–59.

[22] Cociorva, D., Wilkins, J., Lam, C., Baumgartner, G., Sadayappan, P., Ramanujam, J., "Loop Optimizations for a Class of Memory-Constrained Computations." In *Proceedings of the 15th ACM International Conference on Supercomputing (ICS '01)*, Sorrento, Italy, 16–21 June 2001, pp. 103–113.

[23] Cociorva, D., Wilkins, J., Baumgartner, G., Sadayappan, P., Ramanujam, J., Nooijen, M., Bernholdt, D.E., Harrison, R.J., "Towards Automatic Synthesis of High-Performance Codes for Electronic Structure Calculations: Data Locality Optimization." In *Proceedings of the International Conference on High-Performance Computing (HiPC '01)*, Hyderabad, India, 17–20 December 2001. In Lecture Notes in Computer Science, Vol. 2228, Springer-Verlag, pp. 237–248.

[24] Baumgartner, G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Lam, C., Nooijen, M., Ramanujam, J., Sadayappan, P., "A Performance Optimization Framework for Compilation of Tensor Contraction Expressions into Parallel Programs." *7th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS '02)*, In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS '02)*, Fort Lauderdale, Florida, 15 April 2002, IEEE Computer Society, pp. 106–114.

[25] Cociorva, D., Baumgartner, G., Lam, C., Sadayappan, P., Ramanujam, J., Nooijen, M., Bernholdt, D.E., Harrison, R.J., "Space-Time Trade-Off Optimization for a Class of Electronic Structure Calculations." In *Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI '02)*, Berlin, Germany, 17–19 June 2002, pp. 177–186.

[26] Cociorva, D., Baumgartner, G., Lam, C., Sadayappan, P., Ramanujam, J., "Memory-Constrained Communication Minimization for a Class of Array Computations." In Bill Pugh, Chau-Wen Tseng (eds.): *Proceedings of the 15th International Workshop on Languages and Compilers for Parallel Computing (LCPC '02)*, College Park, Maryland, 25–27 July 2002. Lecture Notes in Computer Science, Vol. 2481, Springer-Verlag, 2005, pp. 1–15.

[27] Baumgartner, G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Hirata, S., Lam, C., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., "A High-Level Approach to Synthesis of High-Performance Codes for Quantum Chemistry." In *Proceedings of Supercomputing 2002*, Baltimore, Maryland, 16–22 November 2002, IEEE Computer Society Press, Abstract p. 5, 10 pages.

[28] Cociorva, D., Gao, X., Krishnan, S., Baumgartner, G., Lam, C., Sadayappan, P., Ramanujam, J., "Global Communication Optimization for Tensor Contraction Expressions under Memory Constraints." In *Proceedings of the 2003 International Parallel and Distributed Processing Symposium (IPDPS '03)*, Nice, France, 22–26 April 2003, IEEE Computer Society Press, Abstract p. 37b, 8 pages.

[29] Bibireata, A., Krishnan, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., Ramanujam, J., Bernholdt, D.E., Choppella, V., "Memory-Constrained Data Locality Optimization for Tensor Contractions." In Lawrence Rauchwerger (ed.): *Proceedings of the 16th International Workshop on Languages and Compilers for Parallel Computing (LCPC '03)*, College Station, Texas, 2–4 October 2003. Lecture Notes in Computer Science, Vol. 2958, Springer-Verlag, pp. 93–108.

[30] Chakravarti, A.J., Wang, X., Hallstrom, J.O., Baumgartner, G., "Implementation of Strong Mobility for Multi-Threaded Agents in Java." In *Proceedings of the 2003 International Conference on Parallel Processing (ICPP '03)*, Kaohsiung, Taiwan, 6–9 October 2003. IEEE Computer Society Press, pp. 321–330. An extended version is available as Ohio State Tech Report OSU-CISRC-2/03-TR06.

[31] Krishnamoorthy, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., "Efficient Parallel Out-of-Core Matrix Transposition." In *Proceedings of the IEEE International Conference on Cluster Computing (Cluster '03)*, Hong Kong, China, 1–4 December 2003, IEEE Computer Society Press, pp. 300–307.

[32] Krishnan, S., Krishnamoorthy, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., Ramanujam, J., Bernholdt, D.E., Choppella, V., "Data Locality Optimization for Synthesis of Efficient Out-of-Core Algorithms." In *Proceedings of the International Conference on High-Performance Computing (HiPC '03)*, Hyderabad, India, 17–20 December 2003. In Lecture Notes in Computer Science, Vol. 2913, Springer-Verlag, pp. 406–417. **Best paper award.**

[33] Krishnan, S., Krishnamoorthy, S., Baumgartner, G., Lam, C., Ramanujam, J., Sadayappan, P., Choppella, V., "Efficient Synthesis of Out-of-Core Algorithms Using a Nonlinear Optimization Solver." In *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS '04)*, Santa Fe, New Mexico, 26–30 April 2004, IEEE Computer Society Press, Abstract p. 34b, 10 pages. **Best paper award.**

[34] Chakravarti, A.J., Baumgartner, G., Lauria, M., "The Organic Grid: Self-Organizing Computation on a Peer-to-Peer Network." In *Proceedings of the First International Conference on Autonomic Computing (ICAC '04)*, New York, NY, 17–18 May 2004, IEEE Computer Society Press, pp. 96–103. An extended version is available as Ohio State Tech Report OSU-CISRC-10/03-TR55.

[35] Lu, Q., Gao, X., Krishnamoorthy, S., Baumgartner, G., Ramanujam, J., Sadayappan, P., "Empirical Performance-Model Driven Data Layout Optimization." In Rudolf Eigenmann, Zhiyuan Li, Sam Midkiff (eds.): *Proceedings of the 17th International Workshop on Languages and Compilers for Parallel Computing (LCPC '04)*, West Lafayette, Indiana, 22–25 September 2004. Lecture Notes in Computer Science, Vol. 3602, Springer-Verlag, 2005, pp. 72–86.

[36] Chakravarti, A.J., Baumgartner, G., Lauria, M., "Application-Specific Scheduling for the Organic Grid." In *Proceedings of the 5th IEEE/ACM International Workshop on Grid Computing (Grid '04)*. Pittsburgh, Pennsylvania, 8 November 2004, pp. 146–155.

[37] Krishnamoorthy, S., Baumgartner, G., Lam, C., Nieplocha, J., Sadayappan, P., "Efficient Layout Transformation Support for Disk-based Multidimensional Arrays." In Luc

Bougé, Viktor K. Prasanna (eds.), *Proceedings of the 11th Annual International Conference on High-Performance Computing (HiPC '04)*, Bangalore, India, 19–22 December 2004. In Lecture Notes in Computer Science, Vol. 3296, Springer-Verlag, pp. 386–398.

[38] Hartono, A., Sibiryakov, A., Nooijen, M., Baumgartner, G., Bernholdt, D.E., Hirata, S., Lam, C., Pitzer, R.M., Ramanujam, J., Sadayappan, P., "Automated Operation Minimization of Tensor Contraction Expressions in Electronic Structure Calculations." In *Proceedings of the International Conference on Computational Science 2005 (ICCS '05)*, Atlanta, Georgia, 22–25 May 2005, Part I. In Lecture Notes in Computer Science, Vol. 3514, Springer-Verlag, pp. 155–164.

[39] Gao, X., Sahoo, S.K., Lu, Q., Baumgartner, G., Lam, C., Ramanujam, J., Sadayappan, P., "Performance Modeling and Optimization of Parallel Out-of-Core Tensor Contractions." In *Proceedings of the ACM SIGPLAN 2005 Symposium on Principles and Practice of Parallel Programming (PPoPP '05)*, Chicago, Illinois, 15–17 June 2005, pp. 266–276.

[40] Gao, X., Krishnamoorthy, S., Sahoo, S.K., Lam, C., Baumgartner, G., Ramanujam, J., Sadayappan, P., "Efficient Search-Space Pruning for Integrated Fusion and Tiling Transformations." In Eduard Ayguadé, Gerald Baumgartner, J. Ramanujam, P. Sadyappan (eds.): *Proceedings of the 18th International Workshop on Languages and Compilers for Parallel Computing (LCPC '05)*, Hawthorne, New York, 20–22 October 2005. Lecture Notes in Computer Science, Vol. 4339, Springer-Verlag, 2006, pp. 215–229.

[41] Hartono, A., Lu, Q., Gao, X., Krishnamoorthy, S., Nooijen, M., Baumgartner, G., Bernholdt, D.E., Choppella, V., Pitzer, R.M., Ramanujam, J., Rountev, A., Sadayappan, P., "Identifying Cost-Effective Common Subexpressions to Reduce Operation Count in Tensor Contraction Evaluations." In Vassil N. Alexandrov, Geert Dick van Albada, Peter M.A. Sloot, Jack J. Dongarra (eds.): *Proceedings of the International Conference on Computational Science 2006 (ICCS '06)*, Part I, Reading, United Kingdom, 28–31 May 2006. Lecture Notes in Computer Science, Vol. 3991, Springer-Verlag, 2006, pp. 267–275.

Edited Books

[42] Ayguadé, E., Baumgartner, G., Ramanujam, J., Sadyappan, P., (eds.), *Languages and Compilers for Parallel Computing*, Proceedings of the 18th International Workshop (LCPC '05), Hawthorne, New York, 20–22 October 2005. Lecture Notes in Computer Science, Vol. 4339, Springer-Verlag, 2006.

Workshop Publications

[43] Rizzoni, G., Keyhani, A., Washington, G.N., Chandrasekaran, B., Baumgartner, G., "Education in Electronic Systems at the Ohio State University." In *Proceedings of the ASME Dynamic Systems and Control Division, 1998 International Mechanical Engineering Congress & Exposition*, 15–20 November 1998, Anaheim, California. American Society of Mechanical Engineers, DSC-Vol. 64, pp. 389–396.

[44] Keyhani, A., Marwali, M.N., Baumgartner, G., "A Virtual DSP System for Design Instruction of Power Converters." *Digital Signal Processing (DSPS) Fest*, 4–6 August 1999, Houston, Texas. Texas Instruments, 7 pages.

[45] Baumgartner, G., Keyhani, A., "A Virtual Embedded Systems Testbed for Instruction and Design." *Digital Signal Processing (DSPS) Fest*, 2–4 August 2000, Houston, Texas. Texas Instruments, 14 pages, poster presentation.

[46] Wang, X., Hallstrom, J., Baumgartner, G., "Reliability Through Strong Mobility." In *Proceedings of the 7th ECOOP Workshop on Mobile Object Systems: Development of Robust and High Confidence Agent Applications (MOS '01)*, Budapest, Hungary, 18 June 2001, pp. 1-13.

[47] Baumgartner, G., Jansche, M., Peisert, C.D., "Support for Functional Programming in Brew." In Kei Davis, Yannis Smaragdakis, Jörg Striegnitz (eds.): *Proceedings of the 2001 ECOOP Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL '01), 1st International Workshop*, Budapest, Hungary, 18 June 2001, Publication Series of the John von Neumann Institute for Computing, Vol. 7, pp. 111–125.

[48] Baumgartner, G., Cociorva, D., Lam, C., Ramanujam, J., Sadayappan, P., "Compiler Support for Optimizing Tensor Contraction Expressions in Quantum Chemistry Computations." In *Proceedings of the Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL '02)*, 21 June 2002, New York, NY.

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[51] Krishnamoorthy, S., Baumgartner, G., Lam, C., Nieplocha, J., Sadayappan, P., "Layout Transformation Support for the Disk Resident Arrays Framework." In *Proceedings of the Los Alamos Computer Science Initiative Symposium (LACSI '04)*. Santa Fe, New Mexico. 12–14 October 2004, 14 pages.

[52] Gao, X., Krishnamoorthy, S., Sahoo, S.K., Lam, C., Baumgartner, G., Ramanujam, J., Sadayappan, P., "Efficient Search-Space Pruning for Integrated Fusion and Tiling Transformations." In *Proceedings of the 12th Workshop on Compilers for Parallel Computers (CPC '06)*, A Coruña, Spain, 9–11 January 2006, 15 pages.

[53] Allam, A., Ramanujam, J., Baumgartner, G., Sadayappan, P., "Memory Minimization for Tensor Contractions using Integer Linear Programming." In *Proceedings of the Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL '06)*, 29 April 2006, Rhodes Island, Greece. In *Proceedings of the 2006 International Parallel and Distributed Processing Symposium (IPDPS '06)*, IEEE Computer Society Press, 2006, 8 pages.

[54] Panyala, A., Bhattacharya, P., Baumgartner, G., Ramanujam, J., "Model-Driven Search-Based Loop Fusion Optimization for Handwritten Code." In *Proceedings of the 17th Workshop on Compilers for Parallel Computing (CPC '13)*, Lyon, France, 3–5 July 2013, 6 pages.

Technical Reports

[55] Baumgartner, G., *Floating-Slash Arithmetic: An Implementation in* Common Lisp. RISC-Linz Report 87.39-0, Research Institute for Symbolic Computation, University of Linz, Austria, January 1988.

[56] Baumgartner, G., Lichtenberger, F., *EUREKA-Project OASIS: Proposal for Research Activities in Symbolic Computation and Parallelization.* RISC-Linz Report 88-30.0, Research Institute for Symbolic Computation, University of Linz, Austria, July 1988.

[57] Baumgartner, G., Stansifer, R.D., *A Proposal to Study Type Systems for Computer Algebra.* RISC-Linz Report 90-87.0, Research Institute for Symbolic Computation, University of Linz, Austria, March 1990.

[58] Baumgartner, G., Russo, V.F., *Signatures: A C++ Extension for Type Abstraction and Subtype Polymorphism.* Technical Report CSD-TR-93-059, Department of Computer Sciences, Purdue University, December 1994. Superseded by Technical Report CSD-TR-95-051. An improved version appears in *Software—Practice & Experience*, Vol. 25, No. 8, pp. 863–889, August 1995.

[59] Baumgartner, G., Russo, V.F., *Implementing Signatures for C++*. Technical Report CSD-TR-95-025, Department of Computer Sciences, Purdue University, August 1995. An improved version appears in *ACM Transactions on Programming Languages and Systems*, Vol. 19, No. 1, January 1997.

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[62] Läufer, K., Baumgartner, G., Russo, V.F., *Safe Structural Conformance for Java*. Technical Report OSU-CISRC-6/98-TR20, Department of Computer and Information Science, The Ohio State University, June 1998. A previous version is available as Technical Report CSD-TR-96-077, Department of Computer Sciences, Purdue University, December 1996. An improved version appears in *Computer Journal*, Vol. 43, No. 6, 2001, pp. 469–481.

[63] Lam, C., Cociorva, D., Baumgartner, G., Sadayappan, P., *Memory-Optimal Evaluation of Expression Trees Involving Large Objects*. Technical Report No. OSU-CISRC-5/99-TR13, Dept. of Computer and Information Science, The Ohio State University, May 1999, updated March 2001.

[64] Butkevich, S., Renedo, M., Baumgartner, G., Young, M., *Compiler and Tool Support for Debugging Object Protocols*. Technical Report No. OSU-CISRC-3/00-TR10, Dept. of Computer and Information Science, The Ohio State University, March 2000. An improved version appears in the *Proceedings of FSE-8*, San Diego, California, November 2000.

[65] Baumgartner, G., Jansche, M., Läufer, K., *Half & Half: Multiple Dispatch and Retroactive Abstraction for Java*. Technical Report No. OSU-CISRC-5/01-TR08, Dept. of Computer and Information Science, The Ohio State University, updated March 2002.

[66] Cociorva, D., Baumgartner, G., Lam, C., Sadayappan, P., Ramanujam, J., Nooijen, M., Bernholdt, D.E., Harrison, R.J., *Space-Time Trade-Off Optimization for a Class of Electronic Structure Calculations*. Technical Report No. OSU-CISRC-11/01-TR24, Dept. of Computer and Information Science, The Ohio State University, November 2001. An improved version appears in the *Proceedings of POPL 2002*, Berlin, Germany, June 2002.

[67] Chakravarti, A.J., Wang., X., Hallstrom, J.O., Baumgartner, G., *Strongly-Mobile Multi-Threaded Agents in Java*. Technical Report No. OSU-CISRC-2/03-TR06, Dept. of Computer and Information Science, The Ohio State University, March 2003.

[68] Krishnamoorthy, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., *On Efficient Out-of-Core Matrix Transposition*. Technical Report No. OSU-CISRC-9/03-TR52, Dept. of Computer and Information Science, The Ohio State University, September 2003.

[69] Chakravarti, A.J., Baumgartner, G., Lauria, M., *The Organic Grid: Self-Organizing Computation on a Peer-to-Peer Network*. Technical Report No. OSU-CISRC-10/03-TR55, Dept. of Computer and Information Science, The Ohio State University, October 2003.

[70] Chakravarti, A.J., Baumgartner, G., Lauria, M., *Application-Specific Scheduling for the Organic Grid*. Technical Report No. OSU-CISRC-4/04-TR23, Dept. of Computer and Information Science, The Ohio State University, April 2004.

[71] Gao, X., Sahoo, S.K., Lu, Q., Baumgartner, G., Lam, C., Ramanujam, J., Sadayappan, P., *Compiler Techniques for Efficient Parallelization of Out-of-Core Tensor Contractions*. Technical Report No. OSU-CISRC-12/04-TR67, Dept. of Computer Science and Engineering, The Ohio State University, December 2004.

[72] Hartono, A., Sibiryakov, A., Nooijen, M., Baumgartner, G., Bernholdt, D.E., Hirata, S., Lam, C., Pitzer, R.M., Ramanujam, J., Sadayappan, P., *Automated Operation Minimization of Tensor Contraction Expressions in Electronic Structure Calculations*. Technical Report No. OSU-CISRC-2/05-TR10, Dept. of Computer Science and Engineering, The Ohio State University, February 2005.

Workshop Presentations

[73] Baumgartner, G., "Automatic Construction of Verification Systems from Language Definitions." In U. Furbach, M. Heisel, W. Reif, W. Stephan (eds.): *Proceedings of the Workshop on Verification, Construction and Synthesis of Programs*, 6–7 April 1989, Karlsruhe, Germany. Technical Report 10/89, Institute for Logic, Complexity and Deductive Systems, University of Karlsruhe, Germany.

[74] Baumgartner, G., Russo, V.F., "Type Abstraction and Subtype Polymorphism for C++." *Spring 1993 Workshop of the Midwest Society for Programming Languages and Systems*, 10 April 1993, University of Iowa, Iowa City, Iowa.

[75] Baumgartner, G., "Modularization Constructs for Object-Oriented and Functional Languages." In Mary-Beth Rosson (ed.): *OOPSLA '94 Doctoral Symposium*, Conference on Object-Oriented Programming Systems, Languages, and Applications, 24 October 1994, Portland, Oregon.

[76] Baumgartner, G., Läufer, K., Russo, V.F., "What Design Patterns Teach Us About Language Design." *Fall 1996 Workshop of the Midwest Society for Programming Languages and Systems*, 5 October 1996, University of Wisconsin, Madison, Wisconsin.

[77] Baumgartner, G., "What Design Patterns Teach Us About Language Design." *Java/JVM Workshop*, 26–27 June 1997, Indiana University, Bloomington, Indiana.

[78] Baumgartner, G., Läufer, K., Russo, V.F., "An Object Model for Building Scalable Applications." *Advanced Topics Workshop*, 1998 USENIX Conference on Object-Oriented Technologies and Systems (COOTS), 1 May 1998, Santa Fe, New Mexico, USENIX Association.

[79] Keyhani, A., Marwali, M.N., Baumgartner, G., "A Virtual Testbed for Instruction Design and Control of Power Converters." *1998 IEEE Power Engineering Society Summer Meeting*, 17 July 1998, San Diego, California.

[80] Baumgartner, G., Lu, P., Läufer, K., Shah, D., "Extending Java with Structural Subtyping and Multimethods." *Fall 1999 Workshop of the Midwest Society for Programming Languages and Systems*, 9 October 1999, Illinois Institute of Technology, Chicago, Illinois.

[81] Baumgartner, G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Lam., C., Nooijen, M., Ramanujam, J., Sadayappan, P., "Compilation of a High-Level Quantum Chemistry Language into Efficient Parallel Code." *Spring 2002 Workshop of the Midwest Society for Programming Languages and Systems*, 13 April 2002, Indiana University, Bloomington, Indiana.

[82] Hirata, S., Baumgartner. G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Nooijen, M., Pitzer, R., Ramanujam, J., Sadayappan, P., Wilkins, J.W., "Operator and Tensor Contraction Engines — Computer-Aided Synthesis of Coupled-Cluster Programs of any Given Excitation Order." *American Conference of Theoretical Chemistry*, 13–18 July 2002, Pittsburgh, Pennsylvania, poster presentation.

[83] Baumgartner, G., Keyhani, A., "Embedded Systems Programming Instruction Using a Virtual Testbed." *NSF Engineering and Computing Education Grantees Conference*, 30 September – 1 October 2002, Washington, DC.

[84] Chakravarti, A.J., Wang, X., Hallstrom, J.O., Baumgartner, G., "Strongly Mobile Multi-Threaded Agents in Java." *Fall 2002 Workshop of the Midwest Society for Programming Languages and Systems*, 23 November 2002, Illinois Institute of Chicago, Chicago, IL.

[85] Bernholdt, D.E., Choppella, V., Dean, D., Harrison, R.J., Papenbrock, T., Strayer, M., White, T., Hirata, S., Baumgartner, G., Cociorva, D., Pitzer, R.M., Sadayappan, P., Ramanujam, J., Nooijen, M., Auer, A., "A High-Level Approach to the Synthesis of High-Performance Codes for Quantum Chemistry." *SIAM Conference on Computational Science and Engineering*, 10–13 February 2003, San Diego, California.

[86] Bernholdt, D.E., Choppella, V., Dean, D., Harrison, R.J., Papenbrock, T., Strayer, M., White, T., Hirata, S., Baumgartner, G., Cociorva, D., Pitzer, R.M., Sadayappan, P., Ramanujam, J., Nooijen, M., Auer, A., "A High-Level Approach to the Synthesis of High-Performance Codes for Quantum Chemistry." *University of Tennessee Chemical Physics Workshop*, 20–22 February 2003, Knoxville, Tennessee, **invited talk**.

[87] Baumgartner, G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Hirata, S., Lam, C., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., Choppella, V., "A High-Level Approach to Synthesis of High-Performance Codes for Quantum Chemistry." *43rd Sanibel Symposium*, University of Florida Quantum Theory Project, 22 February – 1 March 2003, Sanibel, Florida, poster presentation.

[88] Nooijen, M., Baumgartner, G., Bernholdt, D.E., Cociorva, D., Harrison, R.J., Hirata, S., Ramanujam, J., Sadayappan, P., Pitzer, R.M., Auer, A., "Automatic Synthesis of Advanced Electronic Structure Programs." *225th ACS National Meeting*, 23–27 March 2003, New Orleans, Louisiana, American Chemical Society.

[89] Baumgartner, G., Liu, J., Keyhani, A., "A Virtual Testbed for Embedded Systems Education and Software Development." *Spring 2003 Workshop of the Midwest Society for Programming Languages and Systems*, 5 April 2003, Purdue University, West Lafayette, Indiana, **invited talk**.

[90] Baumgartner, G., Cociorva, D., Bibireata, A., Gao, X., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Sibiryakov, A., Pitzer, R.M., Sadayappan, P., Bernholdt, D.E., Choppella, V., Hirata, S., Ramanujam, J., Nooijen, M., Auer, A., "Computer Aided Implementation of Many-Body Methods: The Tensor Contraction Engine." *226th ACS National Meeting*, 7–11 September 2003, New York, NY, American Chemical Society, poster presentation.

[91] Sadayappan, P., Auer, A., Baumgartner, G., Bernholdt, D.E., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hirata, S., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sibiryakov, A., "Automatic Synthesis of High-Performance Parallel Programs for Electronic Structure Methods." *226th ACS National Meeting*, 7–11 September 2003, New York, NY, American Chemical Society, poster presentation.

[92] Bernholdt, D.E., Auer, A., Baumgartner, G., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hirata, S., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., Sibiryakov, A., "Synthesizing Highly Optimized Code for Correlated Electronic Structure Calculations." *226th ACS National Meeting*, 7–11 September 2003, New York, NY, American Chemical Society.

[93] Bernholdt, D.E., Auer, A., Baumgartner, G., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hirata, S., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sadayappan, P., Sibiryakov, A., White, T., "A High-Level Approach to the Synthesis of High-Performance Codes for Quantum Chemistry." *Los Alamos Computer Science Institute Symposium (LACSI '03)*, 27 October 2003, Los Alamos, New Mexico, poster presentation.

[94] Sadayappan, P., Auer, A., Baumgartner, G., Bernholdt, D.E., Bibireata, A., Choppella, V., Cociorva, D., Gao, X., Harrison, R.J., Hirata, S., Krishnamoorthy, S., Krishnan, S., Lam, C., Lu, Q., Nooijen, M., Pitzer, R.M., Ramanujam, J., Sibiryakov, A., "A High-Level Approach to the Synthesis of High-Performance Codes for Quantum Chemistry." *44th Sanibel Symposium*, University of Florida Quantum Theory Project, 28 February – 5 March 2004, Sanibel, Florida, poster presentation.

[95] Sadayappan, P., Auer, A., Baumgartner, G., Bernholdt, D.E., Harrison, R.J., Hirata, S., Lam, C., Nooijen, M, Pitzer, R.M., Ramanujam, J., Bibireata, A., Gao, X., Krishnamoorthy, S., Krishnan, S., Lu, Q., Sibiryakov, A., "Performance Optimization Issues in Automatic Synthesis of High-Performance Codes for Correlated Electronic Structure Methods." *228th ACS National Meeting*, 22–26 August 2004, Philadelphia, Pennsylvania, American Chemical Society.

[96] Chakravarti, A.J., Peel, A., Baumgartner, G., Lauria, M., "The Organic Grid: Self-Organizing Computation on a Peer-to-Peer Network." *IEEE International Conference on Cluster Computing (Cluster 04)*, San Diego, California, 20–23 September 2004, poster presentation.

[97] Baumgartner, G., "Performance Optimization Issues in the Automatic Synthesis of High-Performance Codes for Tensor Contraction Expressions in Quantum Chemistry." *Tensor Minisymposium* at the 2009 SIAM Annual Meeting, July 2009, Denver, Colorado, **invited talk**.

[98] Panyala, A., Bhattacharya, P., Baumgartner, G., Ramanujam, J., "A Fusion-Based Optimization Framework for a Tensor Contraction Language." *7th International Workshop on Parallel Matrix Algorithms and Applications (PMAA '12)*, 28–30 June 2012, London, UK.

[99] Panyala, A., Bhattacharya, P., Baumgartner, G., Ramanujam, J., "Optimizing Hand-written Tensor Contraction Code: Our Experience." *SIAM Conference on Parallel Processing for Scientific Computing (PP '14)*, 18–21 February 2014, Portland, Oregon.

Workshop Proceedings

[100] Baumgartner, G., Russo, V.F., (eds.), *Proceedings of the MSPLS Spring 95 Workshop*, 8 April 1995, Purdue University, West Lafayette, Indiana. Technical Report CSD-TR-95-057, Department of Computer Sciences, Purdue University, September 1995.

[101] Baumgartner, G., Läufer, K., (eds.), *Proceedings of the MSPLS Spring 98 Workshop*, 16 May 1998, Loyola University Chicago, Chicago, Illinois. Technical Report OSU-CISRC-6/98-TR21, Department of Computer and Information Science, The Ohio State University, June 1998.

[102] Baumgartner, G., Ramanujam, J., Sadayappan, P., (eds.), *Proceedings of the Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL '02).*, 21 June 2002, New York, NY. Held in conjunction with the 16th Annual ACM International Conference on Supercomputing (ICS '02).

[103] Baumgartner, G., Ramanujam, J., Sadayappan, P., (eds.), *Proceedings of the Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL '06).*, 29 April 2006, Rhodes Island, Greece. In *Proceedings of the 2006 International Parallel and Distributed Processing Symposium (IPDPS '06)*, IEEE Computer Society Press, 2006.

[104] Baumgartner, G., Ramanujam, J., Rountev, A., Sadayappan, P., (eds.), *Proceedings of the Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL '07).*, 30 March 2007, Long Beach, California. In *Proceedings of the 2006 International Parallel and Distributed Processing Symposium (IPDPS '07)*, IEEE Computer Society Press.

Software Systems

[105] Baumgartner, G., *Extension of the GNU C++ Compiler with Signatures.* See G. Baumgartner: "Type Abstraction Using Signatures." In Richard M. Stallman (ed.): *Using and Porting GNU CC.* Free Software Foundation, Cambridge, Massachusetts, 26 November 1995, Section 7.6, pp. 180–182. Available as part of the GCC distribution from Version 2.6.0 through Version 2.95.

[106] Läufer, K., Baumgartner, G., Russo, V.F., *An Extension of the Sun JDK-1.0.2 Java Compiler with Structural Subtyping.* June 1998.

[107] Baumgartner, G., Bibireata, A., Choppella, V., Gao, X., Krishnamoorthy, S., Krishnan, S., Lu, Q., Ramanujam, J., Sadayappan, P., Sibiryakov, A., *The Tensor Contraction Engine.* January 2008.

[108] Baumgartner, G., Lam, C., Panyala, A., Cociorva, D., Sadayappan, P., *The Loop Fusion Algorithm: Memory Minimization and Space-Time Trade-Offs.* An implementation in ML, September 2010.

Theses

[109] Baumgartner, G., *Generating Verification Systems from Language Definitions.* Master's Thesis, University of Linz, and RISC-Linz Report 88.14-0, Research Institute for Symbolic Computation, University of Linz, Austria, March 1988.

[110] Baumgartner, G., *Modularization Constructs for Functional and Object-Oriented Languages.* Ph.D. Thesis, Department of Computer Sciences, Purdue University, August 1996.

Invited Presentations

The Current State in the Design of the RISC-Library, Warsaw, Poland, June 1989.

Type Systems for Computer Algebra, RISC-Linz, Austria, Dec. 1989.

Type Abstraction and Subtype Polymorphism for C++, RISC-Linz, Austria, May 1993.

Implementing Signatures for C++, Loyola University, Chicago, Illinois, Mar. 1994.

Data Abstraction for Object-Oriented Languages, in Spanish, Mexico City, Mexico, June 1994.

Implementing Signatures for C++, RISC-Linz, Austria, Dec. 1994.

Introduction to the JVM, Java/JVM Workshop, Indiana University, Jul. 1997.

Brew: A Successor of Java with Support for Design Patterns and Protocols, Central Ohio Java Day 1998, 24 September 1998, Columbus, Ohio, Central Ohio Java Users Group.

The Future of Java, Panel Member, Fall '98 Meeting of the Midwest Society for Programming Languages and Systems (MSPLS), Oct. 1998.

Brew: A Successor of Java with Support for Design Patterns and Protocols, in German, University of Linz, Austria, Dec. 1998.

Brew: A Successor of Java with Support for Design Patterns and Protocols, in German, Technical University of Vienna, Austria, Dec. 1998.

Reliability Through Strong Mobility, University of Venice, Venice, Italy, Jul. 2001.

Space-Time Trade-Off Optimization for a Class of Electronic Structure Calculations, in German, University of Halle, Halle, Germany, Jun. 2002.

Space-Time Trade-Off Optimization for a Class of Electronic Structure Calculations, RISC-Linz, Austria, Jul. 2002.

The Tensor Contraction Engine: a Domain-specific Compiler for Synthesis of High-performance Code from Quantum Chemistry Tensor Equations, in German, University of Salzburg, Austria, Jun. 2012.

Conference and Workshop Organization

Co-chair, Fall 95 Workshop of the Midwest Society for Programming Languages and Systems (MSPLS), 1995.

Co-President of the Midwest Society for Programming Languages and Systems (MSPLS), 1996–2005.

Co-chair, Spring 98 Workshop of the Midwest Society for Programming Languages and Systems (MSPLS), 1998.

Co-chair, Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL), 2002.

Co-chair, 18th International Workshop on Languages and Compilers for Parallel Computing (LCPC), 2005.

Co-chair, Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL), 2006.

Co-local organizer, program committee member, 19th International Workshop on Languages and Compilers for Parallel Computing (LCPC), 2006.

Co-chair, Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL), 2007.

Co-chair, Workshop on Performance Optimization for High-Level Languages and Libraries (POHLL), 2008.

Finance chair, 17th ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming (PPoPP), 2012.

Program Committees

1998 USENIX Conference of Object-Oriented Technologies and Systems (COOTS), 1997.

2000 Conference on Object-Oriented Programming Languages, Systems, and Applications (OOPSLA), 2000.

Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL), 2002.

Workshop on Declarative Programming in the Context of OO Languages (DP-COOL), 2003.

Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL), 2003.

Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL), 2004.

IEEE 20th Intl. Conference on Advanced Information Networking and Applications, 2006.

International Conference on Parallel Processing (ICPP), 2006.

Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL), 2007.

20th Intl. Workshop on Languages and Compilers for Parallel Computing (LCPC), 2007.

Workshop on Multiparadigm Programming with Object-Oriented Languages (MPOOL), 2008.

21st Intl. Workshop on Languages and Compilers for Parallel Computing (LCPC), 2008.

Refereeing Activity

1989 Conference of the Austrian Association for Artificial Intelligence, 1988.

Journal of Structured Programming, 1989.

ACM SIGSAM 1989 Intl. Symposium on Symbolic and Algebraic Computation, 1989.

Several textbooks on programming languages and compilers, 1998–2012.

Software — Practice & Experience, 1993, 1994, 1995, 1996.

Communications of the ACM special issue, five papers, 1997.

Two-volume book on Object-Oriented Application Frameworks, 1997.

Journal of Programming Languages, 1997.

IEEE Transactions on Software Engineering, 1997, 1999.

Edited Book on Foundations of Component-Based Systems, 1999.

1999 International Conference on High Performance Computing (HiPC '99).

ACM Transactions on Programming Languages and Systems, 2001.

Parallel Computing, 2002.

IEEE Transactions on Parallel and Distributed Systems, 2003, 2004.

Proceedings of the IEEE, 2004.

The Handbook of Information Security, 2004.

The Computer Journal, 2004, 2005.

Journal of Systems and Software, 2006.

Simulation Modeling Practice and Theory, 2006.

2008 International Conference on Programming Languages, Design, and Implementation (PLDI '08).

IEEE Transactions on Parallel and Distributed Systems, 2008.

IEEE Transactions on Systems, Man, and Cybernetics, Part A: Systems and Humans, 2008.

Computing in Science and Engineering, 2008, 2009.

Journal of System Architecture, 2007, 2009, 2010.

IEEE International Conference on Computer and Communication Technologies (ICCCT), 2011.

German Israeli Foundation, 2012.

Journal of Grid Computing, 2013.

Journal of Parallel and Distributed Computing, 2013.

19th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, 2013.

National Science Foundation, 2005, 2007, 2012, 2014.

Professional Societies

Member of the Upsilon Pi Epsilon Honor Society for the Computing Sciences, since April 1993.

Member of the Association for Computing Machinery, since October 1988.

Awards

1. Best Paper Award (Systems) for "Data Locality Optimization for Synthesis of Efficient Out-of-Core Algorithms" by Krishnan, S., Krishnamoorthy, S., Baumgartner, G., Cociorva, D., Lam, C., Sadayappan, P., Ramanujam, J., Bernholdt, D.E., Choppella, V. *International Conference on High-Performance Computing (HiPC '03)*, Hyderabad, India, 17–20 December 2003.

2. Best Paper Award (Applications Track) for "Efficient Synthesis of Out-of-Core Algorithms Using a Nonlinear Optimization Solver" by Krishnan, S., Krishnamoorthy, S., Baumgartner, G., Lam, C., Ramanujam, J., Sadayappan, P., Choppella, V. *International Parallel and Distributed Processing Symposium (IPDPS '04)*, Santa Fe, New Mexico, 26–30 April 2004.

3. College of Basic Sciences Undergraduate Teaching Award, Spring 2008.

4. Commendation for Excellence in Teaching by the Dean of Basic Sciences, November 2008.

Students Graduated

Xiaojin Wang, M.S. Thesis, December 2001, *Translation from Strong Mobility to Weak Mobility for Java.*

Alina Bibireata, M.S. Thesis, January 2004, *Memory-Constrained Data Locality Optimization for Tensor Contractions.*

Martin Jansche, M.S. Thesis, January 2004, *Multiple Dispatch for Java*.

Arjav J. Chakravarti, Ph.D., June 2004, *Autonomic Scheduling of Scientific Applications on a Peer-to-Peer Network*.

Jing Liu, M.S. Thesis, August 2004, *A Virtual Testbed for Embedded Systems Development and Instruction*.

Amol Patwardhan, M.S. Thesis, July 2006, *An Architecture for Adaptive Real Time Communication with Embedded Devices*.

Rajneesh Kambham, M.S. Project, October 2006, *An Execution Environment for Mobile Computations on the Organic Grid*.

Chakradhar Medavarapu, M.S. Thesis, January 2007, *An Architecture for Embedded System Communication*.

Guohui Deng, M.S. Project, August 2007, *Generating Embedded System Analyzer*.

Pamela Bhattacharya, M.S. Thesis, June 2008, *Model-Driven Search-Based Loop Fusion Optimization for Handwritten Code*.

Srinivas Pola, M.S. Project, December 2008, *Tiling Optimization for Handwritten Code*.

Lakshmi Sindhuri Rimmalapudi, M.S. Project, December 2008, *Implementation of Multiple Dispatch for Java*.

Vamshi Kodimala, M.S. Project, May 2012, *Re-implementation of Tensor Contraction Engine Frontend*.

Ronnie Gilkey, M.S. Thesis, May 2012, *Object Protocols as a Tool for Debugging Method Call Sequence Constraints*.

Archana Vallabhaneni, M.S. Project, December 2012, *Code Generation for Implementing Multi-Methods in Java*.

Srikant Labade, M.S. Thesis, May 2014, *A Virtual Testbed for Embedded Systems*.

Ajay Panyala, Ph.D., August 2014, *Search-Based Model-Driven Loop Optimizations for Tensor Contractions*.

Undergraduate Honors Theses Advised

Joseph Cali, May 2007, *Applying Model-View-Controller to an Embedded System Simulation*.

Abhishek Debchoudhury, May 2007, *Designing a Simulated Testing System for Embedded Systems Development*.

Brian Poulin, May 2013, *Semantic Analysis in the Tensor Contraction Engine*.

Kit Hymel, May 2013, *Single-term Optimization in the Tensor Contraction Engine*.

Administrative Duties

At Ohio State:

Secretary at Faculty Meetings, 1997–1998.
Member of Curriculum Committee, 1997–2004.

At Louisiana State:

Organizer for Departmental Seminar Series, 2005–2008.
Co-Chair of Courses & Curriculum Committee, 2005–2011.
Coordinator for ABET Accreditation, 2006–2011.
Member of Scholarship Awards Committee, 2007–2011.
Member of Faculty Search Committee, 2008–2009.

Member of Allocation of TAs and Evaluation of their Performance Committee, 2009–2011.

Acting Chair, June-Aug. 2010 (7 weeks).

Member of Faculty Search Committee, 2011.

Chair of Industrial Advisory Board Committee, 2011–2012.

Member of the Graduate Admissions Committee, 2011–2012.

Member of the Courses & Curriculum Committee, since 2011.

Member of the Accreditation Committee, 2011–2013.

Member of the EECS School Chair Search Committee, 2012.

Co-Chair of Faculty Search Committee, 2013–2014.

Courses Taught

At Linz University:

315.523: Automatic Programming II (Program Synthesis and Program Transformations)

At Purdue:

CS 181: Programming II Recitation

CS 352: Programming Languages and Compilers

CS 636: Internetworking

At Ohio State:

CIS 655: Introduction to the Principles of Programming Languages

CIS/EE 694X: Introduction to Embedded Systems Programming

CIS 755: Programming Languages

CIS 756: Compiler Design and Implementation

CIS/EE 768: Applied Component-Based Programming for Engineers and Scientists

CIS 788.07H: Languages for Programming the Web

CIS 788.07R: Design of Object-Oriented Programming Languages

At Louisiana State:

CSC 1351: Introduction to Computer Science II for Majors

CSC 4101: Programming Languages

CSC 4351: Compiler Construction

CSC 7101: Programming Language Structures

CSC 7700: Virtualization