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Citizenship: The Netherlands

Education

B.S. in Mathematics and Computer Science, University of Wisconsin-Madison, Aug. 1981.

Ph.D. in Applied Mathematics, University of Maryland, College Park, Aug. 1987.

Professional Experience

September 2002 - : Professor, Department of Computer Sciences, The University of Texas at Austin.

September 1992 - : Member, Texas Institute for Computational and Applied Mathematics, The University of Texas at Austin.

September 1994 - August 2002: Associate Professor, Department of Computer Sciences, The University of Texas at Austin.

September 1987 - August 1994: Assistant Professor, Department of Computer Sciences, The University of Texas at Austin.

Aug. 1990 - May 1991: Research Professor, Computer Science Department, University of Tennessee, Knoxville.

Thesis Title

Implementing the QR-algorithm on an array of processors.

Thesis Advisor

Professor G. W. (Pete) Stewart, Department of Computer Science, University of Maryland.

Current Research Interests

Parallel Computing; Scientific Computing; Linear Algebra; High-Performance Computing; Software Architectures of Scientific Libraries; Mechanical Derivation of Libraries; Formal Derivation

Publications

Many of the listed recent publications can be found on-line at

<http://www.cs.utexas.edu/users/flame/>
and
<http://www.cs.utexas.edu/users/plapack/>

Books

1. Robert A. van de Geijn and Enrique S. Quintana-Ortí. *Science of Programming Matrix Computations*. www.lulu.com, 2008.
2. Robert A. van de Geijn. *Using PLAPACK: Parallel Linear Algebra Package*. The MIT Press, 1997.
3. Robert A. van de Geijn (editor). *Programming Dense Matrix Libraries: The FLAME Collection from ACM TOMS*. ACM Press, in preparation.

Journal Articles

1. Paolo Bientinesi, Victor Eijkhout, Kyungjoo Kim, Jason Kurtz and Robert van de Geijn. "Sparse Direct Factorizations through Unassembled Hyper-Matrices." *Computer Methods in Applied Mechanics and Engineering*. To appear.
2. Richard M. Veras, Jonathan S. Monette, Enrique S. Quintana-Ortí, and Robert A. van de Geijn. Transforming Linear Algebra Libraries: From Abstraction to High Performance. *ACM Transactions on Mathematical Software*. In review.
3. Paolo Bientinesi and Robert van de Geijn. A Goal-Oriented and Modular Approach to Stability Analysis. *SIAM Journal on Matrix Analysis and Applications*. In review.
4. Field G. Van Zee, Ernie Chan, Robert A. van de Geijn, Enrique S. Quintana-Ortí, and Gregorio Quintana-Ortí. Introducing: The libflame Library for Dense Matrix Computations. *IEEE Computation in Science and Engineering*. To appear.
5. Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Robert A. van de Geijn, Field G. Van Zee, and Ernie Chan. Programming Matrix Algorithms-by-Blocks for Thread-Level Parallelism. *ACM Transactions on Mathematical Software*. 36(3) Article 14, 14 pages, 2009.
6. Enrique Quintana-Orti and Robert van de Geijn. Updating an LU Factorization with Pivoting. *ACM Transactions on Mathematical Software*. 35(2) Article 11, 16 pages, 2009.
7. Kazushige Goto and Robert A. van de Geijn. High-Performance Implementation of the Level-3 BLAS. *ACM Transactions on Mathematical Software*, 35(1) Article 4, 14 pages, 2009.
8. Paolo Bientinesi, Brian Gunter, and Robert van de Geijn. Families of Algorithms Related to the Inversion of a Symmetric Positive Definite Matrix *ACM Transactions on Mathematical Software*, 35(1) Article 3, 22 pages, 2009.
9. Kazushige Goto and Robert A. van de Geijn. Anatomy of a High-Performance Matrix Multiplication. *ACM Transactions on Mathematical Software*. 34(2) Article 12, 25 pages, 2008.
10. Field G. Van Zee, Paolo Bientinesi, Tze Meng Low, and Robert A. van de Geijn. Scalable Parallelization of FLAME Code via the Workqueuing Model. *ACM Transactions on Mathematica Software*, 34(2) Article 10, 29 pages, 2008.
11. Ernie Chan, Marcel Heimlich, Avijit Purkayastha, and Robert van de Geijn. Collective Communication: Theory, Practice, and Experience. *Concurrency and Computation: Practice and Experience*, 19(13):1749–1783, July 5, 2007.
12. H. Carter Edwards and Robert A. van de Geijn. Application Interface to Parallel Dense Matrix Libraries: Just let me solve my problem! *Concurrency and Computation: Practice and Experience*. In revision.

13. Gregorio Quintana-Ortí and Robert van de Geijn. Improving the Performance of Reduction to Hessenberg Form. *ACM Transactions on Mathematical Software*, 32(2):180-194, 2006.
14. Thierry Joffrain, Tze Meng Low, Enrique S. Quintana-Ortí, Robert van de Geijn, and Field Van Zee. On Accumulating Householder Transformations. *ACM Transactions on Mathematical Software*, 32(2):169-179, 2006.
15. Brian Gunter and Robert van de Geijn. Parallel Out-of-Core Computation and Updating of the QR Factorization. *ACM Transactions on Mathematical Software*, 32(1):60-78, March 2005.
16. Paolo Bientinesi, Inderjit S. Dhillon, and Robert A. van de Geijn. A Parallel Eigensolver for Dense Symmetric Matrices Based on Multiple Relatively Robust Representations. *SIAM Journal on Scientific Computing*, Vol. 27, No. 1, 2005.
17. Paolo Bientinesi, Enrique S. Quintana-Ortí, and Robert van de Geijn. Representing Linear Algebra Algorithms in Code: The FLAME APIs. *ACM Transactions on Mathematical Software*, 31(1):27-59, March 2005.
18. Paolo Bientinesi, John A. Gunnels, Margaret E. Myers, Enrique S. Quintana-Ortí, and Robert van de Geijn. The Science of Deriving Dense Linear Algebra Algorithms. *ACM Transactions on Mathematical Software*, 31(1):1-26, March 2005.
19. Enrique S. Quintana-Ortí and Robert van de Geijn. Formal Derivation of Algorithms: The Triangular Sylvester Equation. *ACM Transactions on Mathematical Software*, (29) 2, June 2003.
20. John A. Gunnels, Fred G. Gustavson, Greg M. Henry, and Robert A. van de Geijn. FLAME: Formal Linear Algebra Methods Environment. *ACM Transactions on Mathematical Software*, 27(4):422-455, December 2001.
21. Enrique S. Quintana-Ortí and Robert van de Geijn. Specialized parallel algorithms for solving Lyapunov and Stein equations. *Journal of Parallel and Distributed Computing*, **61**, pp. 1489–1504, 2001.
22. Enrique S. Quintana, Gregorio Quintana, Xiaobai Sun, and Robert van de Geijn. A note on parallel matrix inversion. *SIAM Journal on Scientific Computing*, 22(5):1762–1771, 2001.
23. Y. Fu, K. J. Klimkowski, G. J. Rodin, E. Berger, J. C. Browne, J. K. Singer, R. A. van de Geijn, and K. S. Vemaganti. A fast solution method for three-dimensional many-particle problems of linear elasticity. *International Journal on Numerical Methods in Engineering*, 42:1215–1229, 1998.
24. Robert van de Geijn and Jerrell Watts. SUMMA: Scalable universal matrix multiplication algorithm. *Concurrency: Practice and Experience*, 9(4):255–274, April 1997.
25. D. Giménez, V. Hernández, R. van de Geijn, and A. M. Vidal. A block Jacobi method on a mesh of processors. *Concurrency, Practice and Experience*, 9(5):391–411, May 1997.
26. Po Geng, J. Tinsley Oden, and Robert van de Geijn. A parallel multifrontal algorithm and its implementation. *Computational Methods in Applied Mechechanics and Engineering*, 149:289–301, 1997.
27. Almadena Chtchelkanova, John Gunnels, Greg Morrow, James Overfelt, and Robert A. van de Geijn. Parallel implementation of BLAS: General techniques for level 3 BLAS. *Concurrency: Practice and Experience*, 9(9):837–857, September 1997.
28. M. Barnett, D. Payne, R. van de Geijn, and J. Watts. Broadcasting on meshes with wormhole routing. *Journal of Parallel and Distributed Computing*, 35:111–112, 1996.

29. Greg M. Henry and Robert A. van de Geijn. Parallelizing the QR algorithm for the unsymmetric algebraic eigenvalue problem: Myths and reality. *SIAM Journal on Scientific Computing*, 17(4):870–883, 1996.
30. Brian Grayson and Robert van de Geijn. A high performance parallel Strassen implementation. *Parallel Processing Letters*, 6(1):3–12, 1996.
31. Po Geng, J. Tinsley Oden, and Robert van de Geijn. Massively parallel computation for acoustical scattering problems using boundary element methods. *Journal of Sound and Vibration*, 191(1):145–165, 1996.
32. Jerrell Watts and Robert van de Geijn. A pipelined broadcast for multidimensional meshes. *Parallel Processing Letters*, 5(2):281–292, 1995.
33. E. Barragy and R. van de Geijn. High performance computational kernels for selected segments of a p finite element code. *International Journal on Numerical Methods in Engineering*, 38:1327–1340, 1995.
34. E. Barragy, G.F. Carey, and R. van de Geijn. Performance and scalability for block preconditioned finite element (p) solution of viscous flow. *International Journal on Numerical Methods in Engineering*, 38:1535–1554, 1995.
35. M. Barnett, R. Littlefield, D. Payne, and R. van de Geijn. Global combine algorithms for 2-d meshes with wormhole routing. *Journal of Parallel and Distributed Computing*, 24:191–201, 1995.
36. R. A. van de Geijn. On global combine operations. *Journal of Parallel and Distributed Computing*, 22:324–328, 1994.
37. Jack Dongarra, Robert van de Geijn, and David Walker. Scalability issues affecting the design of a dense linear algebra library. *Journal of Parallel and Distributed Computing*, 22(3), Sept. 1994.
38. Tom Cwik, Robert van de Geijn, and Jean Patterson. The application of parallel computation to integral equation models of electromagnetic scattering. *Journal of the Optical Society of America A*, 11(4):1538–1545, April 1994.
39. E. Barragy, G.F. Carey, and R. van de Geijn. Performance and scalability of finite element analysis for parallel computation. *Journal of Parallel and Distributed Computing*, 21:202–212, 1994.
40. Robert A. van de Geijn. Deferred shifting schemes for parallel QR methods. *SIAM Journal on Matrix Analysis and Application*, 14(1):180–194, January 1993.
41. Jack Dongarra and Robert van de Geijn. Reduction to condensed form on distributed memory architectures. *Parallel Computing*, 18:973–982, 1992.

Major Software Efforts

1. libFLAME
2. Parallel Linear Algebra Package (PLAPACK)
3. Interprocessor Collective Communications Library (intercom)
4. Complex Dense Linear Solver, Release 2.0.

Articles in Conference Proceedings

1. Mercedes Marqus, Gregorio Quintana-Ort, Enrique S. Quintana-Ort, and Robert van de Geijn. "Out-of-Core Computation of the QR Factorization on Multi-Core Processors." Euro-Par 2009.
2. Mercedes Marqus, Gregorio Quintana-Ort, Enrique S. Quintana-Ort, and Robert van de Geijn. "Solving "Large" Dense Matrix Problems on Multi-Core Processors and GPUs" 10th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing - PDSEC'09. Roma (Italia). 2009.
3. Mercedes Marqus, Gregorio Quintana-Ort, Enrique S. Quintana-Ort, and Robert van de Geijn. "Using Graphics Processors to Accelerate the Solution of Out-of-Core Linear Systems" 8th IEEE International Symposium on Parallel and Distributed Computing, Lisbon (Portugal), 2009.
4. Mara Jess Zafont, Alberto Martn, Francisco D. Igual, and Enrique S. Quintana-Ort. "Fast Development of Dense Linear Algebra Codes on Graphics Processors." 14th International Workshop on High-Level Parallel Programming Models and Supportive Environments, 2009. Rome, Italy.
5. Gregorio Quintana-Orti, Francisco D. Igual, Enrique S. Quintana-Orti, Robert van de Geijn. Solving Dense Linear Systems on Platforms with Multiple Hardware Accelerators. Proceedings of 2009 ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming, Raleigh, North Carolina, February 2009.
6. Gregorio Quintana-Orti, Enrique S. Quintana-Orti, Ernie Chan, Robert van de Geijn, and Field G. Van Zee. Design of Scalable Dense Linear Algebra Libraries for Multithreaded Architectures: the LU Factorization. Proceedings of the Workshop on Multithreaded Architectures and Applications, Miami, Florida, April 2008.
7. Gregorio Quintana-Orti, Enrique S. Quintana-Orti, Alfredo Remon, and Robert A. van de Geijn. An Algorithm-by-Blocks for SuperMatrix Band Cholesky Factorization. Proceedings of the 8th International Meeting on High Performance Computing for Computational Science, Toulouse, France, June 2008.
8. Jeff Diamond, Behnam Robatmili, Stephen W. Keckler, Robert van de Geijn, Kazushige Goto, Doug Burger. High Performance Dense Linear Algebra on a Spatially Distributed Processor. Proceedings of 2008 ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming, Salt Lake City, Utah, February 2008.
9. Ernie Chan, Field G. Van Zee, Paolo Bientinesi, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, and Robert van de Geijn. SuperMatrix: A Multithreaded Runtime Scheduling System for Algorithms-by-Blocks. Proceedings of 2008 ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming, p. 123-132, Salt Lake City, Utah, February 2008.
10. Gregorio Quintana-Ortí, Enrique S. Quintana-Ortí, Ernie Chan, Field G. Van Zee, and Robert A. van de Geijn. Scheduling of QR factorization algorithms on SMP and multi-core architectures. Proceedings of the 16th Euromicro International Conference on Parallel, Distributed and network-based Processing, Toulouse, France, February 2008.
11. Ernie Chan, Field G. Van Zee, Enrique S. Quintana-Ortí, Gregorio Quintana-Ortí, Robert van de Geijn. Satisfying your Dependencies with SuperMatrix. Proceedings of IEEE Cluster Computing 2007, pp. 91-99, Austin, Texas, September 2007.
12. Bryan Marker, Field Van Zee, Kazushige Goto, Gregorio Quintana-Orti, Robert van de Geijn. Toward Scalable Matrix Multiply on Multithreaded Architectures. Proceedings of European Conference on Parallel and Distributed Computing (EuroPar07), pp. 748-757, Rennes, France, August 2007.

13. Ernie Chan, Enrique Quintana-Orti, Gregorio Quintana-Orti, and Robert van de Geijn. SuperMatrix Out-of-Order Scheduling of Matrix Operations for SMP and Multi-Core Architectures. SPAA'07: Proceedings of the Nineteenth ACM Symposium on Parallelism in Algorithms and Architectures. pp. 116-125. 2007.
14. Paolo Bientinesi and Robert van de Geijn. Formal Correctness and Stability of Linear Algebra Algorithms. *Proceedings of IMACS05*, 2005.
15. Tze Meng Low, Robert van de Geijn, and Field Van Zee. Extracting SMP Parallelism for Dense Linear Algebra Algorithms from High-Level Specifications. *Proceedings of Principles and Practice of Parallel Processing 2005*, 2005.
16. John Gunnels, Fred Gustavson, Greg Henry, and Robert A. van de Geijn. A Family of High-Performance Matrix Multiplication Algorithms. *PARA 2004, LNCS 3732*, pp. 2256-265, 2005.
17. Paolo Bientinesi, John Gunnels, Fred Gustavson, Greg Henry, Margaret Myers, Enrique Quintana-Orti, and Robert A. van de Geijn. Rapid Development of High-Performance Linear Algebra Libraries. *PARA 2004, LNCS 3732*, pp. 376-384, 2005.
18. Paolo Bientinesi, Sergey Kolos, and Robert A. van de Geijn. Automatic Derivation of Linear Algebra Algorithms with Application to Control Theory. *PARA 2004, LNCS 3732*, pp. 385-394, 2005.
19. Thierry Joffrain, Enrique S. Quintana-Orti, and Robert A. van de Geijn. Rapid Development of High-Performance Out-of-Core Solvers. *PARA 2004, LNCS 3732*, pp. 413-422, 2005.
20. Ernie W. Chan, Marcel F. Heimlich, Avi Purkayastha, and Robert A. van de Geijn. On optimizing collective communication. *Proceedings of the 2004 IEEE International Conference on Cluster Computing*, pages 145-155, San Diego, CA, 2004.
21. Thuan D. Cao, John F. Hall, and Robert A. van de Geijn. Parallel Cholesky Factorization of a Block Tridiagonal Matrix. 4ths Workshop on High Performance Scientific and Engineering Computing with Applications (HPSECA-02), in *Proceedings of the International Conference on Parallel Processing 2002 (ICPP-02)*.
22. John A. Gunnels, Daniel S. Katz, Enrique S. Quintana-Ortí, and Robert A. van de Geijn. Fault-tolerant high-performance matrix multiplication: Theory and practice. In *Proceedings of the International Conference for Dependable Systems and Networks (DSN-2001)*, pp. 47-56, July 2-4, 2001.
23. Brian C. Gunter, Wesley C. Reiley, and Robert A. van de Geijn. Parallel Out-of-Core Cholesky and QR factorizations with POOCLAPACK. In *Proceedings of the 15th International Parallel and Distributed Processing Symposium*, San Francisco, CA, April 23-27 (on CD-ROM).
24. John A. Gunnels and Robert A. van de Geijn. Formal methods for high-performance linear algebra libraries. In Ronald F. Boisvert and Ping Tak Peter Tang, editors, *The Architecture of Scientific Software*, pages 193-210. Kluwer Academic Press, 2001. Proceedings of Working Conference on Software Architectures for Scientific Computing Applications (IFIP WG 2.5 WoCo 8).
25. John A. Gunnels, Greg M. Henry, and Robert A. van de Geijn. A family of high-performance matrix multiplication algorithms. In Vassil N. Alexandrov, Jack J. Dongarra, Benjoe A. Juliano, René S. Renner, and C.J. Kenneth Tan, editors, *Computational Science - ICCS 2001, Part I*, Lecture Notes in Computer Science 2073, pages 51-60. Springer-Verlag, 2001.
26. Enrique S. Quintana-Ortí and Robert van de Geijn. Fast parallel kernels for selected problems in control theory. In *Proceedings of the SIAM Conference on Parallel Processing for Scientific Computing 1999*, 1999. (CD-ROM).

27. Greg Morrow and Robert van de Geijn. A parallel linear algebra server for matlab-like environments. In *Proceedings of SC98*, 1998.
28. John Gunnels, Calvin Lin, Greg Morrow, and Robert van de Geijn. A flexible class of parallel matrix multiplication algorithms. In *Proceedings of First Merged International Parallel Processing Symposium and Symposium on Parallel and Distributed Processing (1998 IPPS/SPDP '98)*, pages 110–116, 1998.
29. Greg Baker, John Gunnels, Greg Morrow, Beatrice Riviere, and Robert van de Geijn. PLAPACK: High performance through high level abstraction. In *Proceedings of ICCP98*, 1998.
30. Philip Alpatov, Greg Baker, Carter Edwards, John Gunnels, Greg Morrow, James Overfelt, Robert van de Geijn, and Yuan-Jye J. Wu. PLAPACK: Parallel linear algebra package – design overview. In *Proceedings of SC97*, 1997.
31. Philip Alpatov, Greg Baker, Carter Edwards, John Gunnels, Greg Morrow, James Overfelt, Robert van de Geijn, and Yuan-Jye J. Wu. PLAPACK: Parallel linear algebra package. In *Proceedings of the SIAM Conference on Parallel Processing for Scientific Computing*, 1997.
32. Prasenjit Mitra, David Payne, Lance Shuler, Robert van de Geijn, and Jerrell Watts. Fast collective communication libraries, please. In *Proceedings of the Intel Supercomputing Users' Group Meeting 1995*, 1995.
33. Ken Klimkowski and Robert van de Geijn. Anatomy of an out-of-core dense linear solver. In *Proceedings of the International Conference on Parallel Processing 1995*, volume III - Algorithms and Applications, pages 29–33, 1995.
34. J. G. Lewis, D. G. Payne, and R. A. van de Geijn. Matrix-vector multiplication and conjugate gradient algorithms on distributed memory computers. In *Proceedings of the Scalable High Performance Computing Conference 1994*, May 23–25, Knoxville, TN, pp. 542–550, 1994.
35. Greg Henry and Robert van de Geijn. A parallel unsymmetric eigensolver. In *Proceedings of the Scalable High Performance Computing Conference 1994*, May 23–25, Knoxville, TN, pp. 28–31, 1994.
36. D. Giménez, V. Hernández, R. van de Geijn, and A. M. Vidal. A Jacobi method by blocks on a mesh of processors. In *Proceedings of the International Linear Algebra Symposium*, Aug. 1994.
37. M. Barnett, S. Gupta, D. Payne, L. Shuler, R. A. van de Geijn, and J. Watts. Interprocessor collective communication library (InterCom). In *Proceedings of the Scalable High Performance Computing Conference 1994*, May 23–25, Knoxville, TN, pp. 357–364, 1994.
38. M. Barnett, S. Gupta, D. Payne, L. Shuler, R. van de Geijn, and J. Watts. Interprocessor collective communication library. In *Proceedings of Supercomputing 1994*, Nov. 1994.
39. J. G. Lewis and R. A. van de Geijn. Implementing matrix-vector multiplication and conjugate gradient algorithms on distributed memory multicomputers. In *Proceedings of Supercomputing 1993*, 1993.
40. Jack J. Dongarra, Robert A. van de Geijn, and R. Clint Whaley. Two dimensional basic linear algebra communication subprograms. In *Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing*, March 1993.
41. J. Dongarra, R. van de Geijn, and R. Whaley. *Two Dimensional Basic Linear Algebra Communication Subprograms*, pages 31–40. North Holland, 1993.
42. James Demmel, Jack Dongarra, Robert van de Geijn, and David Walker. LAPACK for distributed memory architectures: The next generation. In *Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing*, 1993.

43. M. Barnett, R. Littlefield, D. Payne, and R. van de Geijn. Global combine on mesh architectures with wormhole routing. In *Proceedings of the 7th International Parallel Processing Symposium*, 1993.
44. M. Barnett, R. Littlefield, D. Payne, and R. van de Geijn. Efficient communication primitives on mesh architectures with hardware routing. In *Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computation*, 1993.
45. R. van de Geijn. Dense linear solve on the intel touchstone delta system. In *Digest of Papers: CompCon92, 37th IEEE Computer Society International Conference*, Feb. 24–28, 1992.
46. Jack Dongarra, Robert van de Geijn, and David Walker. A look at scalable dense linear algebra libraries. In *Proceedings of Scalable High Performance Concurrent Computing '92*, April 27–29, 1992.
47. Jack Dongarra and Robert van de Geijn. A parallel dense linear solve library routine. In *Proceedings of the 1992 Intel Supercomputer Users' Group Meeting*, Oct. 1992.
48. E. Anderson, A. Benzoni, J. Dongarra, S. Moulton, S. Ostrouchov, B. Tourancheau, and R. van de Geijn. LAPACK for distributed memory architectures: Progress report. In *Proceedings of the Fifth SIAM Conference on Parallel Processing for Scientific Computing*, pages 625–630, Philadelphia, 1992. SIAM.
49. R.A. van de Geijn. Storage schemes for parallel eigenvalue algorithms. In G.H. Golub and P. van Dooren, editors, *Numerical Linear Algebra, Digital Signal Processing and Parallel Algorithms*, pages 639–648. NATO ASI Series, Springer Verlag, 1991.
50. R.A. van de Geijn. Efficient global combine operations. In *Sixth Distributed Memory Computing Conference Proceedings*, pages 291–294. IEEE Computer Society Press, 1991.
51. A. Benzoni, V. S. Sunderam, and R.A. van de Geijn. Matrix factorization on a IBM RISC System/6000 workstation network. In *Proceedings of the Second Symposium on High Performance Computing, Montpellier, France*, 1991.
52. E. Anderson, A. Benzoni, J. Dongarra, S. Moulton, S. Ostrouchov, B. Tourancheau, and R. van de Geijn. Basic Linear Algebra Communication Subprograms. In *Sixth Distributed Memory Computing Conference Proceedings*, pages 287–290. IEEE Computer Society Press, 1991.
53. R.A. van de Geijn. Machine independent parallel numerical algorithms. In G.F. Carey, editor, *Parallel Supercomputing: Methods, Algorithms and Applications*, chapter 3, pages 33–44. Wiley, 1989.
54. R.A. van de Geijn and D.G. Hudson. An efficient parallel implementation of the nonsymmetric QR algorithm. In *Proceedings of the Fourth Conference on Hypercube Concurrent Computers and Applications*, 1989.
55. J.W. Juszczak and R.A. van de Geijn. An experiment in coding portable parallel matrix algorithms. In *Proceedings of the Fourth Conference on Hypercube Concurrent Computers and Applications*, 1989.
56. D.P. O'Leary, G.W. Stewart, and R.A. van de Geijn. Domino: A transportable system for parallel processing. In Arthur Wouk, editor, *Parallel Processing and Medium-Scale Multiprocessors*. SIAM, 1989.

Unpublished Manuscripts

1. Greg Morrow and Robert van de Geijn. Zen and the art of high-performance computing. PLAPACK Tutorial (48 pages), October 1998.

Awards and Honors

President's Associates Teaching Excellence Award (2008)

Faculty Fellowship #5 in Computer Sciences, (1995–2002)

Dean's Curriculum Development Award, Spring 1998.

IBM Predoctoral Fellowship, 1986-1987

Dissertation and Thesis Supervision

Ph.D. Dissertations Supervised

Michael Barnett, Ph.D. in Computer Sciences, August 1992. "A Systolizing Compiler," co-supervised with Chris Lengauer.

Timothy Collins, Ph.D. in Computer Sciences, August 1995. "Efficient Matrix Computations Through Hierarchical Type Specifications," co-supervised with J.C. Browne.

H. Carter Edwards, Ph.D. in Computational and Applied Mathematics, May 1997. "A Parallel Infrastructure for Scalable Adaptive Finite Element Methods and its application to Least Squares C-infinity Collocation," co-supervised with Linda Hayes and Mary Wheeler.

John A. Gunnels, Ph.D. in Computer Sciences, Fall 2001. "A Systematic Approach to the Design and Analysis of Linear Algebra Algorithms."

James Overfelt, Ph.D. in Computational and Applied Mathematics, Spring 2002. "A Rapid Solution Methods for Stokesian Emulsions," co-supervised with Greg Rodin.

Paolo Bientinesi, Ph.D. in Computer Sciences, Spring 2006 "Automatic Derivation, Implementation, and Analysis of Linear Algebra Algorithms."

Tze Meng Low, Ph.D. in Computer Sciences, in progress. "An Exploration of the Relation between Loop-Invariants and Loop Transformations."

Ernie Chan, Ph.D. in Computer Sciences, in progress.

Ardavan Pedram, Ph.D. in Electrical and Computer Engineering, in progress.

Bryan Marker, Ph.D. in Computer Sciences, in progress.

Masters Theses Supervised

James Juszczak, Masters in Computer Science, Masters thesis option, Fall 1989 "Parallel Matrix Computations." James is currently Supervisor of Application Development/Strategic Products with Exxon/Mobil.

Lance Shuler, Masters of Mathematics, Masters paper option, Fall 1992. "A Search for LAPACK Condition Number Counterexamples." Lance is currently a Senior Software Engineer with Intel.

Martin Hoff, Masters of Mathematics, Masters paper option, Spring 1993. "The Use of Jacobi Methods for Computing Eigenvalues of Real Symmetric Matrices."

Kenneth Klimkowski, Masters of Computational and Applied Mathematics, Thesis option, Spring 1997. "Application of an Approximate Hierarchical Method to a Parallel Matrix-Vector Product for a Non-Laplacian Operator."

Undergraduate Theses Supervised

Jerrell Watts, Honors Thesis in Computer Science, Spring 1994. “Efficient Collective Communication on Multidimensional Meshes with Worm-Hole Routing.”

Scott Matthews, Honors Thesis in Computer Science, Spring 1994. “Implementation of Monte Carlo Methods in Biological Data Analysis.”

Darin Greene, Honors Thesis in Computer Science, Spring 1995. “Robustness of Collective Communication Algorithms.”

Thierry Joffrain, Honors Thesis in Computer Science, Spring 1998. “Parallel Implementation of Triangular Solve.”

Wesley Reiley, Honors Thesis in Computer Science, Spring 2000. “Efficient Parallel Out-of-Core Implementation of the Cholesky Factorization.”

Marcel Heimlich, Honors Thesis in Computer Science, Summer 2003.

Ernie Chan, Honors Thesis in Computer Science, Spring 2004.

Bryan Marker, Turing Scholars Thesis in Computer Science, Spring 2007.

Recent Grants

Robert van de Geijn (PI), Victor Eijkhout (CoPI), and Calvin (CoPI): Award CCF-0917167 for “SHF: Small: Transforming Linear Algebra Libraries.” Performance period: Sept 1, 2009 - Aug. 31, 2012. Amount: \$400,000;

Victor Eijkhout (PI) and Robert van de Geijn (CoPI): Award CCF-0917096 for “SHF: Small:Toward mechanical derivation of Krylov space algorithms.” Performance Period Aug 15, 2009 - July 31, 2012. Amount: \$473,123;

Robert van de Geijn (PI), Victor Eijkhout (CoPI): Award OCI-0850750 for “Collaborative Research: Mechanical Transformation of Knowledge to Libraries.” Performance period: June 1, 2009 - May 31, 2011. Amount: \$330,000;

Robert van de Geijn (PI) and Kazushige Goto (CoPI): Award CCF-0702714 for “Foundations and Applications of Hierarchically Stored Matrices.” Performance period: May 15 2007-April 30 2010. Amount: \$275,000;

Robert van de Geijn (PI) and Kazushige Goto (CoPI): Award CCF-0540926 for “Foundations of Programming Linear Algebra Algorithms on SMP and Multicore Systems.” Performance period: Feb. 1 2006-Jan. 31 2009. Amount: \$399,999;

Robert van de Geijn (PI): Award CCF-0342369 for “Automatic Tools for Deriving, Analyzing, and Implementing Linear Algebra Libraries.” Performance period: March 1 2004-Feb. 28 2007. Amount: \$299,999.

Robert van de Geijn (PI) (collaboration with Anthony Skjellum): Award ACI-0305163 for “ALGORITHMS: Collaborative Research: A Systematic Approach to the Derivation, Representation, Analysis, and Correctness of Dense and Banded Linear Algebra Algorithms for HPC Architectures.” Performance period: Aug. 2003-July 2006; Amount: \$238,259.

Robert van de Geijn (collaboration with Anthony Skjellum): Award ACI-0203685 for “ALGORITHMS: Collaborative Research: New Contributions to the Theory and Practice of Programming Linear Algebra Libraries.” Performance period: 7/1/02-6/31/03; Amount: \$35,000.

Victor Eijkhout (PI) and Robert van de Geijn (CoPI): Award DME-0625917 for “Sparse Direct Solvers for Unassembled Hyper-Matrices.” Performance period: Sept. 1 2006-Aug. 31 2009. Amount: \$396,687.

Ali Yilmaz (PI), Victor Eijkhout (CoPI), Leszek Demkowidz (CoPI), Robert van de Geijn (CoPI), and John Pearce (CoPI): Award OCI-0904907 for “High-Fidelity Simulation of Bioelectromagnetic Effects on the Human Body with Petascale Computers.” Performance period: Sept. 1 2009- Aug. 31 2014 Amount: \$1,400,000.