

Ilse C.F. Ipsen

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Main Research Interests Numerical linear algebra; with applications to information retrieval, quantum physics, and nonlinear problems; randomized algorithms

Employment

Professor of Mathematics, North Carolina State University, 1998-present
Associate Professor of Mathematics, North Carolina State University, 1993-1998
Associate Professor of Computer Science, Yale University, 1988-1993
Assistant Professor of Computer Science, Yale University, 1985-1988
Associate Research Scientist in Computer Science, Yale University, 1983-1985

Consultant, Scientific Research Associates, New Haven, 1987
Research Associate, AERE Harwell, United Kingdom, summer 1986
Visiting Scientist, ICASE, NASA Langley, summer 1984, 1985

Education

Ph.D. Computer Science, 1983, The Pennsylvania State University
Vordiplom Informatik/Mathematik (summa cum laude), 1977, Universität Kaiserslautern,
Germany

Ph.D. Students

Elizabeth R. Jessup (1989), Shivkumar Chandrasekaran (1994), Rebecca S. Wills (2007),
Teresa M. Selee (2008), Rizwana Rehman (2010)

Outside Recognition

Fellow, Society for Industrial and Applied Mathematics
The work on mapping algorithms to systolic devices was judged to be one of the ten best
research projects sponsored by the Department of Defence in 1986.

Editorial Work

Section editor, SIAM Review, 2005-present
Editorial board, SIAM Review, 2004-present
Editorial board, SIAM Journal on Matrix Analysis and Applications, 1997-present
Editorial board, Numerische Mathematik, 2004-present
Editorial board, Numerical Linear Algebra with Applications, 2007-present
Editor-in-Charge, SIMAX special issues on eigenvalue problems, 2006, 2009
Special Editor, Linear Algebra and its Applications, 2007 conference issue

Conference Organization

Chair, Householder Symposium XIX, Spa, Belgium, 9-13 June 2014
 Householder Committee, 2005-present
 Organizer, SAMSI Industrial Mathematical & Statistical Modeling Workshop for Graduate Students, 2009-present
 Steering Committee, International Summer School on Numerical Linear Algebra, 2007-present
 Program Committee, Sixth Meeting on the Numerical Solution of Markov Chains, Williamsburg, VA, September 2010
 SIAM Vice President for Programs, 2004-2009
 Member, AMS-IMS-SIAM Committee on Summer Research Conferences in the Mathematical Sciences, 2004-2006
 Chair, SIAM evaluation committee for ICIAM 2007 travel grants
 Organizing Committee, 2007 Meeting of the International Linear Algebra Society (ILAS), Shanghai, China, July 2007
 Scientific Program Committee, 6th International Congress on Industrial and Applied Mathematics (ICIAM), Zürich, Switzerland, July 2007
 Steering and Program Committees, 150th Markov Chain Anniversary meeting, Charleston, SC, 12-14 June 2006
 Organizing Committee, 2005 SIAM Annual Meeting, New Orleans, July 2005
 Co-chair, First Joint Meeting of CAIMS & SIAM, 2003 SIAM Annual Meeting, Montréal, Canada, June 2003
 Organizing Committee, Eighth SIAM Conference on Applied Linear Algebra, Williamsburg, VA, July 2003
 Member, SIAM Coordinating Committee for the Joint Mathematics Meetings, 2001-2002
 Co-chair, Seventh SIAM Conference on Applied Linear Algebra 2000, Raleigh, NC, October 2000
 Organizing Committee, Sixth SIAM Conference on Applied Linear Algebra, Snowbird, Utah, October 1997
 Co-Chair, Workshop on Krylov-Space Methods and Applications, Raleigh, March 1995
 Organizing Committee, International Workshop on the Numerical Solution of Markov Chains, Raleigh, January 1995
 Chair, Workshop on Systolic Algorithms and Architectures, Hilton Head, SC, December 1986

Other Professional Activities

Associate Director, SAMSI, 2011-present
 Chair, Advisory Committee of ILAS, 2011-present
 Faculty Fellow, Stat. and Applied Math. Sciences Institute (SAMSI), 2006-2007
 Board of Directors, International Linear Algebra Society (ILAS), 2005-2007
 Chair, SIAM Activity Group on Linear Algebra (SIAG/LA), 2004-2006
 Program director, SIAM Activity Group on Linear Algebra (SIAG/LA), 1998-2003
 SIAG/LA representative to SIAM News, 2001-2006
 Reviewer for Mathematical Reviews, 1998-present
 NERSC Computational Review Panel, 2002-2005
 NSF review panels 1991, 1994, 1995, 2000, 2004-2009, 2011
 NSF site visit team (CISE Institutional Infrastructure proposal) 1994

Plenary Talks at National and International Meetings

- New England Numerical Analysis Day, University of Massachusetts Dartmouth, 16 April 2011
- Conference on Numerical Linear Algebra: Perturbation, Performance and Portability, Austin, Texas, 19-20 July 2010
- Workshop on Algorithms for Modern Massive Data Sets, Stanford, CA, 15-18 June 2010
- Western Canada Linear Algebra Meeting, Banff, Canada, 7-9 May 2010
- 23rd Biennial Numerical Analysis Conference, University of Glasgow, Scotland, June 2009
- Workshop on Large Graphs and Networks: Matrix Algorithms and Applications, University of Manchester, UK, September 2007
- VI International Workshop on Accurate Solution of Eigenvalue Problems, Penn State, May 2006
- Workshop on Algorithmic and Numerical Aspects of Web Search, Pisa, Italy, 6-7 February 2006
- Seventh IMACS International Symposium on Iterative Methods in Scientific Computing, Fields Institute, Toronto, Ontario, Canada, 5-8 May 2005
- Householder Symposium XVI, 23-27 May 2005, Silver Springs, PA
- 12th Meeting of the International Linear Algebra Society (ILAS), Regina, Canada 26-29 June 2005
- V International Workshop on Accurate Solution of Eigenvalue Problems, Hagen, Germany, June 2004
- BIRS Workshop on Theory and Numerics of Matrix Eigenvalue Problems, Banff, Canada, November 2003
- Theoretical and Computational Aspects of Matrix Algorithms, Dagstuhl-Seminar, Germany, October 2003
- Matrix Analysis and Applied Linear Algebra, Raleigh, May 2003
- Householder Symposium XV, Peebles, Scotland, June 2002
- IV International Workshop on Accurate Solution of Eigenvalue Problems, Split, Croatia, June 2002
- III International Workshop on Accurate Solution of Eigenvalue Problems, Hagen, Germany, July 2000
- International Workshop on Accurate Solution of Eigenvalue Problems, Pennsylvania State University, University Park, July 1998
- ODE to linear Algebra and Rational Approximation, conference on the occasion of William B. Gragg's 60th birthday, Naval Postgraduate School, Monterey, CA, November 1996
- International Workshop on Eigenvalue Problems, Split, Croatia, July 1996
- The XIII Householder Symposium on Numerical Linear Algebra, Pontresina, Switzerland, June 1996
- Workshop on Eigenvalues and Beyond, Linear Algebra Year at CERFACS, Toulouse, France, October 1995
- Fifth Conference of the International Linear Algebra Society (ILAS), Atlanta, August 1995
- The XII Householder Symposium on Numerical Algebra, Lake Arrowhead, June 1993
- Workshop on Reliability of Computations, Toulouse, France, March 1993
- 92 Shanghai International Numerical Algebra and its Applications Conference, Shanghai, China, October 1992
- The XI Householder Symposium on Numerical Algebra, Tylosand, Sweden, June 1990
- International Symposium on Optimal Algorithms, Varna, Bulgaria, May 1989
- NATO Advanced Study Institute on Numerical Linear Algebra, Digital Signal Processing

and Parallel Algorithms, Leuven, Belgium, August 1988
 Seminar on Mathematical Methods of VLSI Design and Distributed Computing, Oberwolfach, West Germany, November 1987
 Gatlinburg X, Fairfield Glade, October 1987
 Conference on Vector and Parallel Processing in Computational Science III, Liverpool, United Kingdom, August 1987
 Opening ceremony of the Konrad Zuse Centre in Berlin, West Germany, June 1987
 Seminar on Large Eigenvalue Problems, IBM Europe Institute, Oberlech, Austria, 1985
 Gatlinburg IX, University of Waterloo, Canada, July 1984

Invited Talks at Special Sessions of National and International Meetings

Symposium of the IFIP Working Group 2.5 on Numerical Software, Raleigh, 31 August - 1 September 2009
 Special session on Numerical Linear Algebra, CEDYA-2005, Madrid, Spain, 19-23 September 2005
 Minisymposium on Eigenvector Methods in Information Retrieval, 2005 SIAM Annual Meeting, New Orleans, July 2005
 Minisymposium on Markov Chains and PageRank, 2004 SIAM Annual Meeting, Portland, OR, July 2004
 Minisymposium on Fast, Accurate Solution of Eigenvalue and Singular Value Problems, Eighth SIAM Conference on Applied Linear Algebra, College of William & Mary, July 2003
 Special Session on Linear Algebra and Optimization, Joint Mathematics Meeting, Washington, DC, January 2000
 Householder Meeting XIV on Numerical Linear Algebra, Whistler, B.C., Canada, June 1999
 Minisymposium on Numerical Linear Algebra, 7th Conference of the International Linear Algebra Society, University of Wisconsin, Madison, June 1998
 AMS Southeastern Regional Meeting, Session on Numerical Linear Algebra, Chattanooga, Tennessee, October 1996
 Workshop on Numerical Linear Algebra, 1995 AMS-SIAM Summer Seminar on the Mathematics of Numerical Analysis: Real Number Algorithms, Park City, Utah, August 1995
 Third International Congress on Industrial and Applied Mathematics (ICIAM 95), Hamburg, Germany, July 1995
 Fifth SIAM Conference on Applied Linear Algebra, Snowbird, Utah, June 1994
 Minisymposium on Computational Aspects of Markov Chains, 1994 SIAM Annual Meeting, San Diego, July 1994
 SIAM Conference on Linear Algebra in Signals, Systems and Control, Seattle, August 1993
 Annual Meeting of the German Society for Applied Mathematics and Mechanics (GAMM), Dresden, Germany, April 1993
 40th SIAM Anniversary Meeting, Los Angeles, July 1992
 Fourth SIAM Conference on Applied Linear Algebra, Minneapolis, September 1991
 NA-Day at Stanford (a part of the 25th anniversary celebration of the Stanford CS Department), 9 November 1990
 Second SIAM Conference on Linear Algebra in Signals, Systems and Control, San Francisco, November 1990

First International Conference on Industrial and Applied Mathematics, Paris, France, July 1987

Sixth IMACS Symposium on Computer Methods for Partial Differential Equations, Lehigh University, June 1987

Workshop on Numerical Algorithms for Modern Parallel Computer Architectures, Institute for Mathematics and its Applications, University of Minnesota, November 1986

SIAM Conference on Linear Algebra in Signals, Systems and Control, Boston, August 1986

Workshop on Scientific Applications and Algorithm Design for High Speed Computing, University of Illinois at Urbana-Champaign, April 1986

SPIE Symposium, 549 (Real Time Signal Processing VII), San Diego, 1984

Book *Numerical Matrix Analysis: Linear Systems and Least Squares*, SIAM, 2009

Research Publications

- [1] R. Rehman and I. C. F. Ipsen. La Budde’s method for computing characteristic polynomials. 2010. arXiv:1104.3769v1.
- [2] C. T. Kelley, I. C. F. Ipsen, and S. R. Pope. Rank-deficient and ill-conditioned nonlinear least squares problems. In *Proc. 2010 East Asian SIAM Conf.* 2010.
- [3] S. Eriksson-Bique, M. Solbrig, M. Stefanelli, S. Warkentin, R. Abbey, and I.C.F. Ipsen. Importance sampling for a Monte Carlo matrix multiplication algorithm, with application to information retrieval. *SIAM J. Sci. Comput.*, To appear.
- [4] R. Rehman and I. C. F. Ipsen. Computing characteristic polynomials from eigenvalues. *SIAM J. Matrix Anal. Appl.*, 32:90–114, 2011.
- [5] I. C. F. Ipsen and T. M. Selee. Ergodicity coefficients defined by vector norms. *SIAM J. Matrix Anal. Appl.*, 32(1):153–200, 2011.
- [6] I. C. F. Ipsen, C. T. Kelley, and S. R. Pope. Rank-deficient nonlinear least squares problems and subset selection. *SIAM J. Numer. Math.*, 49(3):1244–1266, 2011.
- [7] M. E. Broadbent, M. Brown, and K. Penner. Subset selection algorithms: Randomized vs. deterministic. *SIAM Undergraduate Research Online*, 3, May 2010. (Faculty advisors: I.C.F. Ipsen and R. Rehman).
- [8] I. C. F. Ipsen. The eigenproblem and invariant subspaces: Perturbation theory. In *G.W. Stewart: Selected Works with Commentaries*, pages 71–93. Birkhäuser, Boston, 2010.
- [9] I. C. F. Ipsen and B. Nadler. Refined eigenvalue bounds for eigenvalues of Hermitian and non-Hermitian matrices. *SIAM J. Matrix Anal. Appl.*, 31(1):40–53, 2009.
- [10] R. S. Wills and I. C. F. Ipsen. Ordinal ranking for Google’s PageRank. *SIAM J. Matrix Anal. Appl.*, 30(4):1677–1696, 2009.
- [11] I. C. F. Ipsen and R. Rehman. Perturbation bounds for determinants and characteristic polynomials. *SIAM J. Matrix Anal. Appl.*, 30(2):762–776, 2008.
- [12] K. I. Dickson, C. T. Kelley, I. C. F. Ipsen, and I. G. Kevrekidis. Condition estimates for pseudo-arclength continuation. *SIAM J. Numer. Anal.*, 45(1):263–276, 2007.
- [13] I. C. F. Ipsen and T. M. Selee. Pagerank computation, with special attention to dangling nodes. *SIAM J. Matrix Anal. Appl.*, 29(4):1281–1296, 2007.
- [14] I. C. F. Ipsen and D. J. Lee. Determinant approximations. Under review. arXiv:1105.0437v1.
- [15] D. E. Finkel, C. Kuster, M. Lasater, R. Levy, J. P. Reese, and I. C. F. Ipsen. Communicating applied mathematics: Four examples. *SIAM Rev.*, 48(2):359–389, 2006.
- [16] I. C. F. Ipsen and S. Kirkland. Convergence analysis of a PageRank updating algorithm by Langville and Meyer. *SIAM J. Matrix Anal. Appl.*, 27(4):952–67, 2006.

- [17] I. C. F. Ipsen and R. S. Wills. Mathematical properties and analysis of Google's PageRank. *Bol. Soc. Esp. Mat. Apl.*, 34:191–6, 2006.
- [18] I. C. F. Ipsen. Departure from normality and eigenvalue perturbation bounds, 2003.
- [19] I. C. F. Ipsen. Ritz value bounds that exploit quasi-sparsity, 2003.
- [20] D. J. Lee and I. C. F. Ipsen. Zone determinant expansions for nuclear lattice simulations. *Phys. Rev. C*, 68:064003, 2003.
- [21] C. Beattie and I. C. F. Ipsen. Inclusion regions for matrix eigenvalues. *Linear Algebra Appl.*, 358(1-3):281–91, 2003.
- [22] I. C. F. Ipsen. A note on unifying absolute and relative perturbation bounds. *Linear Algebra Appl.*, 358(1-3):239–53, 2003.
- [23] Y. Genin, I. C. F. Ipsen, R. Stefan, and P. Van Dooren. Stability radius and optimal scaling of discrete-time periodic systems. In *Proc. IFAC PSYCO 2001*, pages 183–6. July 2001.
- [24] I. C. F. Ipsen. A note on preconditioning non-symmetric matrices. *SIAM J. Sci. Comput.*, 23(3):1050–1, 2001.
- [25] I. C. F. Ipsen. Absolute and relative perturbation bounds for invariant subspaces of matrices. *Linear Algebra Appl.*, 309(1-3):45–56, 2000.
- [26] I. C. F. Ipsen. Expressions and bounds for the GMRES residual. *BIT*, 40(3):524–35, 2000.
- [27] I. C. F. Ipsen. An overview of relative $\sin \Theta$ theorems for invariant subspaces of complex matrices. *J. Comput. Appl. Math.*, 123(1-2):131–153, 2000. Invited Paper for the special issue *Numerical Analysis 2000: Vol. III – Linear Algebra*.
- [28] I. C. F. Ipsen. A note on a certain class of preconditioners for symmetric indefinite linear systems. Technical Report M&CT-TECH-00-005, Mathematics & Computing Technology, Phantom Works Division, The Boeing Company, July 2000.
- [29] J. M. Banoczi, N.-C. Chiu, G. E. Cho, and I. C. F. Ipsen. The lack of influence of the right-hand side on the accuracy of linear system solution. *SIAM J. Sci. Comput.*, 20(1):203–27, 1999.
- [30] G. E. Cho and I. C. F. Ipsen. If a matrix has a single eigenvalue, how sensitive is this eigenvalue? II. Technical Report CRSC-TR98-8, Center for Research in Scientific Computation, Department of Mathematics, North Carolina State University, 1998.
- [31] S. C. Eisenstat and I. C. F. Ipsen. Relative perturbation results for eigenvalues and eigenvectors of diagonalisable matrices. *BIT*, 38(3):502–9, 1998.
- [32] S. C. Eisenstat and I. C. F. Ipsen. Three absolute perturbation bounds for matrix eigenvalues imply relative bounds. *SIAM J. Matrix Anal. Appl.*, 20(1):149–58, 1998.
- [33] I. C. F. Ipsen. Relative perturbation results for matrix eigenvalues and singular values. In *Acta Numerica 1998*, volume 7, pages 151–201. Cambridge University Press, Cambridge, 1998.
- [34] I. C. F. Ipsen. A different approach to bounding the minimal residual norm in Krylov methods. Technical Report CRSC-TR98-19, Center for Research in Scientific Computation, Department of Mathematics, North Carolina State University, 1998.

- [35] I. C. F. Ipsen. A note on the field of values of non-normal matrices. Technical Report CRSC-TR98-26, Center for Research in Scientific Computation, Department of Mathematics, North Carolina State University, 1998.
- [36] I. C. F. Ipsen and C. D. Meyer. The idea behind Krylov methods. *Amer. Math. Monthly*, 105(10):889–99, 1998.
- [37] G. E. Cho and I. C. F. Ipsen. If a matrix has a single eigenvalue, how sensitive is this eigenvalue? Technical Report CRSC-TR97-20, Center for Research in Scientific Computation, Department of Mathematics, North Carolina State University, 1997.
- [38] I. C. F. Ipsen. Computing an eigenvector with inverse iteration. *SIAM Rev.*, 39(2):254–91, 1997.
- [39] S. L. Campbell, I. C. F. Ipsen, C. T. Kelley, C. D. Meyer, and Z. Q. Xue. Convergence estimates for solution of integral equations with GMRES. *J. Integral Equations Appl.*, 8(1):19–34, 1996.
- [40] S. L. Campbell, I. C. F. Ipsen, C. T. Kelley, and C. D. Meyer. GMRES and the minimal polynomial. *BIT*, 36(4):664–75, 1996.
- [41] I. C. F. Ipsen. Helmut Wielandt’s contributions to the numerical solution of complex eigenvalue problems. In B. Huppert and H. Schneider, editors, *Helmut Wielandt, Mathematische Werke, Mathematical Works*, volume 2: Linear Algebra and Analysis, pages 453–63. Walter de Gruyter, Berlin, 1996.
- [42] I. C. F. Ipsen. A history of inverse iteration. In B. Huppert and H. Schneider, editors, *Helmut Wielandt, Mathematische Werke, Mathematical Works*, volume 2: Linear Algebra and Analysis, pages 464–72. Walter de Gruyter, Berlin, 1996.
- [43] S. Chandrasekaran and I. C. F. Ipsen. On the sensitivity of solution components in linear systems of equations. *SIAM J. Matrix Anal. Appl.*, 16(1):93–112, 1995.
- [44] S. Chandrasekaran and I. C. F. Ipsen. Analysis of a QR algorithm for computing singular values. *SIAM J. Matrix Anal. Appl.*, 16(2):520–35, 1995.
- [45] S. C. Eisenstat and I. C. F. Ipsen. Relative perturbation techniques for singular value problems. *SIAM J. Numer. Anal.*, 32(6):1972–1988, 1995.
- [46] I. C. F. Ipsen and C. D. Meyer. The angle between complementary subspaces. *Amer. Math. Monthly*, 102(10):904–11, 1995.
- [47] S. Chandrasekaran and I. C. F. Ipsen. On rank-revealing QR factorisations. *SIAM J. Matrix Anal. Appl.*, 15(2):592–622, 1994.
- [48] S. Chandrasekaran and I. C. F. Ipsen. A divide and conquer algorithm for computing singular values. *Z. Angew. Math. Mech.*, 74(6):T 532–4, 1994.
- [49] S. Chandrasekaran and I. C. F. Ipsen. Backward errors for eigenvalue and singular value decompositions. *Numer. Math.*, 68:215–223, 1994.
- [50] S. Chandrasekaran and I. C. F. Ipsen. On the singular value decomposition of triangular matrices. In Jiang Er-xiong, editor, *Numerical Algebra*, pages 85–9. China Science and Technology Press, 1994.

- [51] S. C. Eisenstat and I. C. F. Ipsen. Relative perturbation bounds for eigenspaces and singular vector subspaces. In *Applied Linear Algebra*, pages 62–65. SIAM, Philadelphia, 1994.
- [52] I. C. F. Ipsen and C. D. Meyer. Uniform stability of Markov chains. *SIAM J. Matrix Anal. Appl.*, 15(4):1061–74, 1994.
- [53] E. R. Jessup and I. C. F. Ipsen. Improving the accuracy of inverse iteration. *SIAM J. Sci. Stat. Comput.*, 13(3):550–72, 1992.
- [54] S. Chandrasekaran and I. C. F. Ipsen. Perturbation theory for the solution of systems of linear equations. Research Report 866, Department of Computer Science, Yale University, 1991.
- [55] J.-M. Delosme and I. C. F. Ipsen. From Bareiss’ algorithm to the stable computation of partial correlations. *Journal of Computational and Applied Mathematics*, 27:53–91, 1989. Also in: *Parallel Algorithms for Numerical Linear Algebra (Advances in Parallel Computing, 1)*, H. van der Vorst and P. Van Dooren, eds., North Holland, 1990.
- [56] J.-M. Delosme and I. C. F. Ipsen. Parallel computation of algorithms with uniform dependences. In *Parallel Processing for Scientific Computing*, pages 319–26. SIAM, 1990.
- [57] I. C. F. Ipsen. Some remarks on the generalised Bareiss and Levinson algorithms. In *Numerical Linear Algebra, Digital Signal Processing and Parallel Algorithms*, pages 189–214. Springer Verlag, 1990.
- [58] I. C. F. Ipsen and E. R. Jessup. Solving the symmetric tridiagonal eigenvalue problem on the hypercube. *SIAM J. Sci. Stat. Comput.*, 11(2):203–29, 1990.
- [59] W. D. Gropp and I. C. F. Ipsen. Recursive mesh refinement on hypercubes. *BIT*, 29:186–211, 1989.
- [60] W. D. Gropp and I. C. F. Ipsen. A Gray code scheme for local uniform mesh refinement on hypercubes. In *Parallel Processing for Scientific Computing*, pages 202–6. SIAM, 1989.
- [61] J.-M. Delosme, I. C. F. Ipsen, and C. C. Paige. The Cholesky factorization, Schur complements, correlation coefficients, angles between vectors, and the QR factorization. Research Report 607, Department of Computer Science, Yale University, 1988.
- [62] J.-M. Delosme and I. C. F. Ipsen. SAGA & CONDENSE: A two-phase approach for the implementation of recurrence equations on multiprocessor architectures. In *Proc. 21st Annual Hawaii Int. Conf. on System Sciences*, volume 1, pages 126–30, 1988.
- [63] I. C. F. Ipsen. Systolic algorithms for the parallel solution of dense symmetric positive-definite Toeplitz systems. In *Numerical Algorithms for Modern Parallel Computer Architectures*, pages 85–108. Springer Verlag, 1988.
- [64] J. L. Barlow and I. C. F. Ipsen. Scaled Givens rotations for the solution of linear least squares problems on systolic arrays. *SIAM J. Sci. Stat. Comp.*, 8:716–33, 1987.
- [65] J.-M. Delosme and I. C. F. Ipsen. Efficient systolic arrays for the solution of Toeplitz systems: An illustration of a methodology for the construction of systolic architectures in VLSI. In *Systolic Arrays*, pages 37–46. Adam Hilger, 1987.
- [66] J.-M. Delosme and I. C. F. Ipsen. Computing partial correlations from the data matrix. Research Report 541, Department of Computer Science, Yale University, 1987.

- [67] P. Hudak, J.-M. Delosme, and I. C. F. Ipsen. ParLance: A para-functional programming environment for parallel and distributed computing. Research Report 524, Department of Computer Science, Yale University, 1987.
- [68] I. C. F. Ipsen and E. R. Jessup. Two methods for solving the symmetric tridiagonal eigenvalue problem on the hypercube. In *Hypercube Multiprocessors 1987*, pages 627–38. SIAM, 1987.
- [69] I. C. F. Ipsen and E. R. Jessup. A comparison of Cuppen’s method and multisection for the solution of tridiagonal eigenvalue problems on the hypercube. In *Advances in Computer Methods for Partial Differential Equations VI*, pages 425–30. IMACS, 1987.
- [70] J.-M. Delosme and I. C. F. Ipsen. Parallel solution of symmetric positive definite systems with hyperbolic rotations. *Linear Algebra and its Applications*, 77:75–111, 1986.
- [71] J.-M. Delosme and I. C. F. Ipsen. Systolic array synthesis: Computability and time cones. In *Parallel Algorithms and Architectures*, pages 295–312. North-Holland, 1986.
- [72] J.-M. Delosme and I. C. F. Ipsen. Design methodology for systolic arrays. In *Advanced Algorithms and Architectures for Signal Processing, Proc. SPIE Symp. 696*, pages 245–59, 1986.
- [73] J.-M. Delosme, I. C. F. Ipsen, and J.-R. Masse. Systolic implementation of a Toeplitz system solver. Research Report 8607, Department of Electrical Engineering, Yale University, 1986.
- [74] I. C. F. Ipsen and Y. Saad. The impact of parallel architectures on the solution of eigenvalue problems. In *Large Scale Eigenvalue Problems*, pages 37–49. Elsevier Science Publishers B.V. (North Holland), 1986.
- [75] I. C. F. Ipsen, Y. Saad, and M. H. Schultz. Complexity of dense-linear-system solution on a multiprocessor ring. *Linear Algebra Appl.*, 77:205–39, 1986.
- [76] S. N. Bhatt and I. C. F. Ipsen. How to embed trees in hypercubes. Research Report 443, Department of Computer Science, Yale University, 1985.
- [77] J.-M. Delosme and I. C. F. Ipsen. An illustration of a methodology for the construction of efficient systolic architectures in VLSI. In *Proc. Second Int. Symp. on VLSI Technology, Systems and Applications*, pages 268–73, Taipei, Taiwan, 1985.
- [78] I. C. F. Ipsen. A parallel QR method using fast Givens’ rotations. Research Report 299, Department of Computer Science, Yale University, 1984.
- [79] I. C. F. Ipsen. Singular value decomposition with systolic arrays. In *Proc. SPIE Symp. 549 (Real Time Signal Processing VII)*, pages 13–21, 1984.
- [80] D. E. Heller and I. C. F. Ipsen. Systolic networks for orthogonal decompositions. *SIAM J. Sci. Stat. Comp.*, 4:261–9, 1983.
- [81] D. E. Heller and I. C. F. Ipsen. Systolic networks for orthogonal equivalence transformations and their applications. In P. Penfield, editor, *Proc. Conference on Advanced Research in VLSI, 1982*, pages 113–22. Artech House, Inc., 1982.

Publications of General Interest

- [1] I. C. F. Ipsen. First SIAG linear algebra school slated for July 2008. *SIAM News*, 40(9):3, November 2007.
- [2] I. C. F. Ipsen. New ideas for SIAM conferences from Europe. *SIAM News*, 39(10):5, December 2006.
- [3] I. C. F. Ipsen. Why aren't SIAM conferences cheaper? *SIAM News*, 38(1):1, January/February 2005.
- [4] I. C. F. Ipsen. How to get SIAM cooperation for your meeting. *SIAM News*, 38(2):2, March 2005.
- [5] I. C. F. Ipsen. Accurate eigenvalues for fast trains. *SIAM News*, 37(9):1–2, November 2004.
- [6] I. C. F. Ipsen and V. Mehrmann. SIAG/LA and ILAS mark twenty years of progress at joint applied linear algebra meeting. *SIAM News*, 34(1):20, January/February 2001.