Kyle A. GALLIVAN

Florida State University
476 Dirac Science Center
Tallahassee FL, 32306
email: gallivan@csit.fsu.edu, gallivan@cs.fsu.edu
phone: 850-645-0306 (CSIT office) 850-906-9896 (home)

Personal Data

Born 10/11/58 in Evergreen Park, IL, USA, Married, U.S. Citizen.

Research Interests

Parallel and efficient numerical algorithms for control, signal processing, image processing, circuit simulation, information retrieval; intrusion detection algorithms via anomaly detection; architectures for scientific computations; performance analysis of high-performance architectures and numerical algorithms; software support for high-performance algorithm design and analysis.

Employment History

FLORIDA STATE UNIVERSITY Tallahassee, FL
August 1997 – present.
Current appointments:

- Professor, Department of Computer Science
- core faculty member of School of Computational Science and Information Technology
- Participating Guest, Center for Applied Scientific Computation, Lawrence Livermore National Laboratory (renewable annually since 1999)
- Adjunct Associate Professor, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign.

Previous appointment: Associate Professor in the Department of Computer Science at Florida State University (Fall 1997 – Summer 1999)

UNIVERSITY OF ILLINOIS Urbana, IL
November 1985 – August 1997.
Final appointments: Research Associate Professor in the Coordinated Science Laboratory; Visiting Associate Professor in the Department of Electrical and Computer Engineering (1996/97 academic year).

Previous appointments: Associate Professor in the Department of Electrical and Computer Engineering (1993/94 academic year through 1995/96 academic year); Senior Computer Scientist in the Center for Supercomputing Research and Development (November 1985 through August 1993); Assistant Professor in the Department of Computer Science; Assistant Professor in the Department of Electrical and Computer Engineering. (The two assistant professor appointments were non-tenure track given to facilitate supervision of M.S./ Ph.D. students and service on examination committees in the respective departments.)

HARRIS CORPORATION — Palm Bay, FL
July 1983 – November 1985.
Associate Principal Engineer, Government Aerospace Systems Division.

UNIVERSITY OF ILLINOIS — Urbana, IL
August 1979 – May 1983.
Graduate Research Assistant, Department of Computer Science, University of Illinois.

ARGONNE NATIONAL LABORATORY — Argonne, IL
September 1977 – August 1979.
Resident Student Associate, Reactor Analysis and Safety Division.

Education

UNIVERSITY OF ILLINOIS — Urbana, IL
Ph. D., Computer Science, 1983. Advisor: C. William Gear

Thesis Title: "An Algorithm for the Detection and Integration of Highly Oscillatory Ordinary Differential Equations Using a Generalized Unified Modified Divided Difference Representation".

M.S., Computer Science, 1981.

Thesis Title: "Detection and Integration of Oscillatory Differential Equations with Initial Stepsize, Order and Method Selection".

LEWIS UNIVERSITY — Romeoville, IL
B.A. (with high honors), Mathematics and Computer Science, 1979.

Professional References

George Cybenko
Dorothy and Walter Gram Professor of Engineering
Thayer School of Engineering
Dartmouth College
US Mail:
Dartmouth College
Thayer School of Engineering
8000 Cummings Hall
Hanover, NH 03755-8000
Phone: 603 646 3546
Email: gvc@dartmouth.edu

Geoffrey Fox
Professor of Computer Science, Physics and Informatics
Indiana University

US Mail:
IPCRES Grid Computing Laboratory
Indiana University
501 N. Morton, Suite 214
Bloomington, IN 47404
Phone: 315 254 6387
Email: gcf@indiana.edu

M. Yousuff Hussaini
Professor, Department of Mathematics and
TMC Eminent Scholar Chair in Computational Science and Engineering
Florida State University
US Mail:
Florida State University
400 Dirac Science Library
Tallahassee, FL 32306-4120
Phone: 850 644 0601
Secretary's email: kane@csit.fsu.edu

David Munson
MacClinche Professor of Electrical and Computer Engineering
Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign
US Mail:
University of Illinois
Coordinated Science Laboratory
1308 West Main Street
Urbana, IL 61801
Phone: 217 333 4789
Email: d-munson@uiuc.edu

Robert J. Plemmons
Z. Smith Reynolds Professor of Mathematics and Computer Science
Departments of Mathematics and Computer Science
Wake Forest University
US Mail:
Wake Forest University
Department of Mathematics
PO Box 7388
Winston-Salem, NC 27109
Phone: 336 758 5358
Email: plemmons@mthcsc.wfu.edu

Ahmed Sameh
Professor and Head
Department of Computer Science
Purdue University
US Mail:

Purdue University
Department of Computer Science
1398 Computer Science Building
West Lafayette, IN 47907
Phone: 765 494 6003
Email: sameh@cs.purdue.edu

Professional and Honor Society Memberships

1982 - present, Association for Computing Machinery (ACM)
1984 - present, The Institute of Electrical and Electronics Engineers Computer Society
1984 - present, SIGMA XI
1986 - present, American Association for the Advancement of Science (AAAS)
1988 - present, Society for Industrial and Applied Mathematics (SIAM)
1991 - present, Phi Kappa Phi Honor Society

Professional Service Activities

Program Committee for 2001 IEEE International Conference on Control Applications.
Program Committee for ACM International Conference on Supercomputing 2001.
National Science Foundation Proposal Review Panel for the Numeric, Symbolic and Geometric Computing Program, November 2000.
Referee for 2000 International Conference on Parallel Processing.
Program Committee for IEEE/ACM Supercomputing 2000.
Program Committee for the 1999 International Workshop on Innovative Architecture for Future Generation High-Performance Processors and Systems.
Program Committee for the 2000 ACM International Conference on Supercomputing.
Program Committee for the 1999 ACM International Conference on Supercomputing.
Program Committee for the 1998 ACM International Conference on Supercomputing.
Program Committee for the 1998 International Workshop on Innovative Architecture for Future Generation High-Performance Processors and Systems.
National Science Foundation Proposal Review Panel for the Numeric, Symbolic and Geometric Computing Program, December 1997.
Program Committee for Fifth Symposium on the Frontiers of Massively Parallel Computation.
Co-chairman for Applications and Algorithms, 1995 International Conference on Parallel Processing.
Vice-chairman for Applications and Algorithms, 1994 International Conference on Supercomputing.

Referee for: National Science Foundation, BIT, ACM Transactions on Mathematical Software, International Journal of Supercomputer Applications, IEEE Transactions on Computers, IEEE Transactions on Computer-Aided Design, IEEE Transactions on Parallel and Distributed Systems, IEEE Computer, Journal of Parallel and Distributed Computing, SIAM Journal of Scientific Computing, Parallel Computing.

Current and Past Graduate Students

Gallivan has advised or co-advised eight graduate students who have completed their Ph.D. degrees. He is currently co-advising a student pursuing his Ph.D. at the University of Illinois. At FSU, he has advised one student for an M.S. degree in computer science on large-scale dynamical systems (thesis option), co-advised one student for an M.S. degree in computer science on intrusion detection for operating systems (thesis option), is currently advising an M.S. student (thesis option) on the mathematics and computation of information retrieval. He has also advised one undergraduate on an honors project.

Thesis advisor for Y. Liu (MS candidate) Department of Computer Science, Florida State University.

CSIT advisor for CSIT Fellowship holder J. Burgy (Ph. D. candidate), Department of Physics, Florida State University, Ph.D. advisor – E. Dagatto.

Thesis co-advisor for C. Schmitz (Ph.D. candidate), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. (with Prof. K. Jenkins currently EE at Penn State University)

Thesis co-advisor for D. Snyder (M.S., 2001), Department of Computer Science, Florida State University. (with Prof. R. Van Engelen, CS FSU)

Thesis advisor for X. Rao (M.S., 1999), Department of Computer Science, Florida State University.

Thesis co-advisor for R. Soni (Ph.D., 1998), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. (with Prof. K. Jenkins, ECE UIUC)

Thesis advisor for E. Grimme (Ph.D., 1997), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign.

Thesis advisor for B. Marsolf (M.S., 1991, Ph.D., 1997), Department of Computer Science, University of Illinois at Urbana-Champaign.

Thesis advisor for S. Thirumalai (Ph.D., 1996), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign.

Thesis advisor for J. Bordner (M.S., 1995), Department of Computer Science, University of Illinois at Urbana-Champaign.

Thesis advisor for U. Meier Yang (Ph.D., 1995), Department of Computer Science, University of Illinois at Urbana-Champaign.

Thesis co-advisor for Y.C. Wen (Ph.D., 1994), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. (with Prof. R. Saleh, ECE)

Thesis co-advisor for G. G. Hung (M.S. 1991, Ph.D. 1993), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. (with Prof. R. Saleh, ECE)

Thesis advisor for X. Wang (Ph.D., 1993), Department of Computer Science, University of Illinois at Urbana-Champaign.

Co-supervisor of research for L. DeRose (M.S., 1991), Department of Computer Science, University of Illinois at Urbana-Champaign. (with Prof. E. Gallopoulos, CS)

Co-supervisor of research for L. Mansen (M.S., 1988), Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. (with Prof. R. Saleh, ECE)

Courses Taught

Florida State University Fall 1997 – present:

Spring 2001

CIS 5930-05 (3 Hrs.) Foundations of Computational Science 1 (graduate section)

CIS 4930 (3 Hrs.) Foundations of Computational Science 1 (undergraduate section)

CIS 5900 (3 Hrs.) DIS on Parallel Numerical Algorithms (H. Hoang)

CIS 4900 (3 Hrs.) DIS on Numerical Algorithms for Image Processing 2 (C. Baker)

STAT 5906 (3 Hrs.) DIS on Filtering Algorithms for Large Scale Dynamical Systems (E. Rubinshtein) (with A. Srivastava Statistics FSU)

Fall 2000

CIS 5930-06 (3 Hrs.) Parallel Programming, Algorithms, and Architectures (graduate section)

CIS 4900 (3 Hrs.) DIS on Numerical Algorithms for Image Processing 1 (C. Baker)

Spring 2000

CDA 4101-01 (3 Hrs.) Computer Organization (3 undergraduate sections)

CGS 5267-01 (3 Hrs.) Computer Organization (graduate section)

Fall 1999

CIS 5930-04 (3 Hrs.) Introduction to Parallel Programming (graduate section)

Spring 1999

CDA 5155-01 (3 Hrs.) Computer Architecture (graduate section)

MAD 6408-01 (3 Hrs.) Practical Parallel Algorithms (graduate section, co-instructor with D. Keyes, Gallivan responsible for approximately 50% of instruction)

Fall 1998

CIS 5930-01 - (3 Hrs.) Introduction to Parallel Programming (graduate section)

Summer 1998

CIS 4900-01 - (3 Hrs.) DIS on Visualization (R. Outlaw)

CIS 5900-03 - (3 Hrs.) DIS on Numerical Linear Algebra (Z. Yuan)

Spring 1998

CDA 3120 - (3 Hrs.) Digital Design (undergraduate section)

CGS 5266 - (3 Hrs.) Digital Design (graduate section)

CIS 4900-02 - (4 Hrs.) DIS Numerical Linear Algebra (R. Outlaw)

Fall 1997

CIS 5930-03 - (3 Hrs.) Introduction to Computational Science

CIS 4900-03 - (3 Hrs.) DIS Introduction to Computational Science (K. Rosado) (Rosado was an undergraduate following CIS 5930)

MAT 5907-09 - (3 Hrs.) DIS on Parallel Processing (P. Bismuti)

MAT 6908-05 - (3 Hrs.) DIS on Parallel Processing (D. Porchia)

University of Illinois:

Spring 1997

ECE 362 - (3 Hrs.) Logic Design (mixed graduate and undergraduate)

Fall 1996

CS 320 - (3 Hrs.) Introduction to Parallel Programming (mixed graduate and undergraduate)

Spring 1996

ECE 362 - (3 Hrs.) Logic Design (mixed graduate and undergraduate)

Fall 1995

ECE 497 - (3 Hrs.) Numerical Linear Algebra for Signals Systems and Control (graduate only)

Spring 1995

ECE 362 - (3 Hrs.) Logic Design (mixed graduate and undergraduate)

Fall 1994

ECE 362 - (3 Hrs.) Logic Design (mixed graduate and undergraduate)

Spring 1994

ECE 362 - (3 Hrs.) Logic Design (mixed graduate and undergraduate)

Fall 1993

CS 454 - (3 Hrs.) Parallel Numerical Linear Algebra (graduate only)

Fall 1992

CS 454 - (3 Hrs.) Parallel Numerical Linear Algebra (graduate only)

Fall 1991

CS 454 - (3 Hrs.) Parallel Numerical Linear Algebra (graduate only)

Fall 1990

CS 454 - (3 Hrs.) Parallel Numerical Linear Algebra (graduate only)

Grant, Proposal, White-paper History and Activity

FSU Current and Recent Support:

National Science Foundation

NSF CCR 0105422 *Improving Symbolic Analysis of Restructuring Compilers*, R. van Engelen PI and K. Gallivan Co-PI at FSU, 9/01 – 8/04, budget $260,000.

NSF CCR 9912415 *Efficient Algorithms for Large Scale Dynamical Systems*, K. Gallivan PI and P. Van Dooren Co-PI at FSU, 09/00–10/03, budget $230,000.

NSF EIA 0072043 *A Comprehensive Retargetable Embedded Systems Software Development Environment*, D. Whalley PI and K. Gallivan Co-PI at FSU, J. Davidson PI at University of Virginia, D. Jones PI at University of Illinois at Urbana-Champaign, 06/00–5/05, FSU portion of budget $800,000.

NSF ASC 9872140 *Interactive Concurrent Visualization of Unsteady Flow on Parallel Architectures* M. Y. Hussaini PI at FSU (CSIT group proposal – Erlebacher, Gallivan, Hussaini and Woodruff), Period: 1/99 – 12/01, Amount $450,566.

Army Research Office

Innovative Computational Methods for Inverse Problems in Optical and SAR Imaging, Army Research Office, R. Plemmons PI at Wake Forest University, 07/00 – 7/03, budget $203,043. Gallivan is paid through Wake Forest University not FSU on this grant (1 month support).

Pending Proposals:

National Science Foundation, *Scalable Approaches to Conceptual-based Information Management*, M. Berry PI and P. Raghavan Co-PI at University of Tennessee, K. Gallivan PI at FSU, 9/01 – 8/04, FSU portion of requested budget $250,000.

National Security Agency, *A Distributed Intrusion Detection Infrastructure for Coordinated Network, Operating System, and Application Protection*, K. Gallivan PI, D. Whalley and A. Yasinsac Co-PIs at FSU, G. Cybenko PI at Dartmouth College, FSU portion of requested budget $400,000.

Previous Support:

National Science Foundation

NSF CCR 9619596 *High Performance Computing for Large Scale Dynamical Systems* from the National Science Foundation. K.A. Gallivan (PI) and P. M. Van Dooren (Co-PI), Period: 02/97 – 02/01, Amount:$130,000 (renumbered CCR 9796315 on transfer to FSU)

NSF CCR 9120105 *Hierarchically Parallel Algorithms for Portable and Scalable Performance.* K.A. Gallivan and E. Gallopoulos (Co-PI's), Period: 05/92 – 04/96, Amount:$178,972, University of Illinois.

NSF CCR 9120105 *Hierarchically Parallel Algorithms for Portable and Scalable Performance.* Addendum to National Science Foundation grant for international travel and research cooperation – $8500.

DARPA

Grant 60NANB2D1272 *Computational Algorithms for Scalable Libraries.* Period: 08/92 – 07/97, Amount:$1,413,000 Multiple Co-PI grant involving the University of Minnesota and the University of Illinois. Gallivan was Co-PI and later PI on the University of Illinois portion.

Lawrence Livermore National Laboratory

Summer 2001 Center for Advanced Scientific Computation, support for a 2 week visit.

Summer 2000 Center for Advanced Scientific Computation, support for a 3 week visit.

Summer 1999 Center for Advanced Scientific Computation, support for a 3 week visit.

IBM

- 1997 IBM Faculty Partnership Award : $20,000.
- 1995 IBM Faculty Partnership Award: $11,000.

Leiden University, The Netherlands

Summer 2000 Department of Computer Science, support for 2.5 week visit.

Summer 1998 Department of Computer Science, support for 2 week visit.

Summer 1995 Department of Computer Science, and the Dutch Science Foundation through the Advanced School for Computing and Imaging, support for 3 week visit for Gallivan and a student (B. Marsolf).

Summer 1994 Department of Computer Science, and the Dutch Science Foundation through the Advanced School for Computing and Imaging, support for 3 week visit.

Catholic University of Louvain,Belgium

Summer 1998 support for a 1 week visit.

NATO

Summer 1998 Support to attend NATO Advanced Study Institute on Error Control and Adaptivity in Scientific Computations, Antalya, Turkey.

Current Research Activities

Gallivan is currently active in several ongoing and recently initiated research activities. A brief summary follows:

1. Stabilization of large scale dynamical systems via algorithms significantly more efficient than recent state-of-the-art algorithms. With Paul Van Dooren (Catholic University of Louvain, Belgium).
2. Model reduction of dynamical systems. With Paul Van Dooren (Catholic University of Louvain, Belgium).
3. Information retrieval via latent semantic indexing and related methods. With M. Berry (University of Tennessee) and S. Woodruff.

4. Numerical methods for synthetic aperture radar and image restoration. With R. Plemmons (Wake Forest University), D. Munson (University of Illinois).
5. Intrusion detection for operating systems via anomaly detection. With R. Van Engelen.
6. Architecture/algorithm interaction and its influence on code generation for embedded systems. With D. Whalley, D. Jones (University of Illinois), J. Davidson (University of Virginia).
7. Novel methods for symbolic processing in restructuring compilers. With R. Van Engelen.
8. Compiler support for SOAP-based RPC and message passing for distributed scientific computing. With R. Van Engelen.

Selected Invited Talks, Conference Awards

Invited talk: "Convergence of Riccati Equation-based Stabilization Algorithms", with with P. Van Dooren, minisymposium on Model Reduction, 2001 SIAM Conference on Control, July 2001, San Diego, CA.

Invited talk: "Incremental Methods for Computing Dominant Singular Spaces", with P. Van Dooren, and Y. Chahlaoui, 2000 Computational Information Retrieval Workshop, October 2000, Raleigh, NC.

Invited talk: "Riccati Equation-based Stabilization of Large Scale Dynamical Systems", with X. Rao and P. Van Dooren, minisymposium on linear algebra in control, IEEE Conference on Decision and Control 2000, Sydney Australia, December 2000.

Invited talk: "Stabilization of Large Scale Dynamical Systems, with X. Rao and P. Van Dooren, session on linear algebra in control, Mathematical Theory of Networks and Systems, Perpignan France, June 2000.

Invited talk: "Efficient Stabilization of Large Scale Dynamical Systems", with X. Rao and P. Van Dooren, session on linear algebra in control, IEEE Conference on Control Applications, Anchorage USA, September 2000.

Best Student Paper Award (Daniel S. Weile): "Rational Krylov Reduced-order Modeling of Multiscreen Frequency Selective Surfaces," with D. S. Weile and E. Michielssen, 1998 Annual Review of Progress in Applied Computational Electromagnetics, Monterey, CA (ACES Symposium),

Outstanding Paper Award: , "On solving block Toeplitz matrices using a block Schur algorithm", with S. Thirumalai, and P. Van Dooren, 1994 International Conference on Parallel Processing, St. Charles IL.

Invited talk: "The Interactive Restructuring of MATLAB Programs Using the FALCON Environment", International Workshop on Innovative Architecture for Future Generation High-Performance Processors and Systems, October 1997, Hawaii.

Invited talk: “Critique of Array Algorithms in Computations and Control by T. Kailath of Stanford University” Delivered critique and led followup discussions at Workshop on Future Directions in Systems and Control, Part of the 35th Allerton Conference on Communication, Control and Computing, October 1997, Allerton IL.

Invited talk: “The Rational Lanczos Method for Model Reduction”, Florida State University, September, 1996.

Invited talk: “The Rational Lanczos Method for Model Reduction”, University of Houston, March, 1996.

Invited talk: “The Rational Lanczos Method for Model Reduction”, Emory University, February, 1996.

Invited talk: “Computational Science on the Cedar Multiprocessor”, University of Delaware, December, 1995.

Invited talk: “Parallel Numerical Linear Algebra Algorithms”, Tutorial Short Course (one day duration), Leiden University, Leiden, The Netherlands, 1995.

Invited talk: “Incomplete Orthogonal Factorizations for Preconditioning Sparse Least Squares Problems”, Technical University of Denmark, Copenhagen, June, 1994.

Invited talk: “The Cedar Multiprocessor”, University of Minnesota, Minneapolis, MN, March, 1992.

Invited talk: “An Overview of the Cedar Multiprocessor and the Basic Performance of Its Memory System”, Polytechnic University of Catalonia, Barcelona, Spain, June, 1991.

Invited talk: “Parallel Algorithms for Dense Matrix Computations”, Second SIAM Conference on Linear Algebra and Signals, Systems and Control, San Francisco, CA, November, 1990. (co-presenter A. Sameh)

Invited talk: “An Overview of the Cedar Multiprocessor System”, Second Conference on Parallel and Vector Processing, University of Illinois at Urbana-Champaign, Urbana, IL, May, 1989.

Invited talk: “Numerical Algorithms for the Cedar Multiprocessor”, Courant Institute, NYU, New York, NY, November, 1988. (co-presenter E. Gallopoulos)

Invited talk: “Circuit Simulation on the Cedar Machine”, Digital Equipment Corporation, Littleton, MA, December, 1986. (co-presenter G-C. Yang)

Submitted for Review

[1] Y. Chahlaoui, K. A. Gallivan, and P. Van Dooren. *Recursive calculation of dominant singular subspaces*, submitted to SIAM SIMAX.

[2] R. Soni, K. Jenkins, and K. Gallivan. *Low-complexity Data-reusing Methods in Adaptive Filtering*, submitted to IEEE Trans. on Signal Processing.

Volumes Edited and Paper Collection

[3] **Proceedings of 1995 International Conference on Parallel Processing**, Vol. 3, *Algorithms and Applications*, K. Gallivan, Editor, CRC Press, 1995, 223 pages.

[4] K. Gallivan, M. Heath, E. Ng, B. Peyton, R. Plemmons, J. Ortega, C. Romine, A. Sameh and R Voight. **Parallel Algorithms for Matrix Computations**. SIAM, Philadelphia, 1990, 197 pages.

Book Chapters

[5] Y. Chahlaoui, P. Van Dooren, and K. A. Gallivan. *Incremental Methods for Computing Dominant Singular Spaces.* In: **2000 Computational Information Retrieval Workshop**, SIAM, Philadelphia, 2001, pp. 61 – 71, Ed. M. Berry.

[6] L. DeRose, B. Marsolf, K. Gallivan, E. Gallopoulos and D. Padua. *Design Issues in a MATLAB-based Environment for Numerical Program Development.* In: **Enabling Technologies For Computational Science: Frameworks, Middleware, and Enviroments**, , Kluwer Academic, Boston, 2000, pp. 315-326, Eds. E. N. Houstis, J. R. Rice, E. Gallopoulos and R. Bramley.

[7] K. A. Gallivan and P. Van Dooren, *Model reduction of large-scale systems: rational Krylov versus balancing techniques.* In: **Error Control and Adaptivity in Scientific Computing**, Kluwer, Amsterdam, 1999, pp. 177–190, Eds. H. Bulgak and C. Zenger.

[8] A. Veidenbaum, P.C. Yew, D. J. Kuck, C. D. Polychronpoulos, D. H. Padua, E.S. Davidson, and K. Gallivan. *The Cedar System.* In: **25 Years of the International Symposia on Computer Architecture, Selected Papers.** ACM Press, 1998, pp. 89–91. (A retrospective paper invited based on a selection of influential computer architecture work of the past 25 years.)

[9] E. Grimme, K. A. Gallivan, P. M. Van Dooren. *On Some Recent Developments in Projection-based Model Reduction.* In: **ENUMATH 97, Second European Conference on Numerical Mathematics and Advanced Applications**, Eds. H. Bock, G. Kanschat, R. Rannacher, F. Brezzi, R. Glowinsky, Y. Kuznetsov and J. Périaux, World Scientific, Singapore, pp. 98-113, 1998.

[10] B. Marsolf, K. Gallivan, and E. Gallopoulos. *The Interactive Restructuring of MATLAB Programs Using the FALCON Environment.* In: **Innovative Architecture for Future Generation High-Performance Processors and Systems**, A. Veidenbaum and K. Joe, Eds., IEEE Computer Society Press, 1998, pp. 3–12.

[11] A. Veidenbaum and K. A. Gallivan. *Decoupled Access DRAM Architecture.* In: **Innovative Architecture for Future Generation High-Performance Processors and Systems**, A. Veidenbaum and K. Joe, Eds., IEEE Computer Society Press, 1998, pp. 94–105.

[12] K. A. Gallivan, B. A. Marsolf, A. Bik, and H. A. G. Wijshoff. *The generation of optimized code using nonzero structure analysis.* In: **Lecture Notes on Computer Science No. 1336**, Springer-Verlag, Berlin, 1997, pp. 1-29.

[13] K. Gallivan, E. Grimme, D. Sorensen, P. Van Dooren. *On some modifications of the Lanczos algorithm and the relation with Padé approximations*, In: **Mathematical Research Series, Vol. 7**, Akademie Verlag, Berlin, 1996, pp. 87-116.

[14] L. DeRose, K. Gallivan, E. Gallopoulos, B. Marsolf, and D. Padua. *FALCON: A MATLAB Interactive Restructuring Compiler.* In: **Languages and Compilers for Parallel Computing**, C.H. Huang, et al., Eds., Springer-Verlag, Berlin, 1995, pp. 269-288.

[15] Kyle Gallivan, Srikanth Thirumalai, and Paul Van Dooren, *A Block Toeplitz Look-ahead Algorithm.* In: **SVD and Signal Processing III, Algorithms, Architectures and Applications**, M. Moonen and B. De Moor, Eds., Elsevier, Amsterdam, 1995, pp. 199-206.

[16] Tz.Ostromsky, Z.Zlatev, P.C.Hansen, and K.Gallivan. *Reordering of Sparse Matrices and Application to a Parallel Sparse Linear System Solver.* In: **Scientific Computation and Mathematical Modeling**, S. M. Markov, Ed., DATECS Publishing, Sofia, 1993, pp. 85-89.

[17] K. Gallivan, W. Jalby, A. Malony, and H. Wijshoff. *Performance Prediction for Parallel Numerical Algorithms.* In: **Parallel Computation**, A. E. Finchman and B. Ford, Eds., Oxford University Press, Oxford, 1993, pp. 81–113.

[18] L. DeRose, K. Gallivan and E. Gallopoulos. *Status Report: Parallel Ocean Circulation on Cedar.* In: **Parallel Supercomputing in Atmospheric Science**, G.-R. Hoffmann and T. Kauranne, Eds., World Scientific Publishers, Singapore, 1993 pp. 157-172.

[19] K. Gallivan, A. Sameh, and Z. Zlatev. *Parallel Direct Methods Codes For General Sparse Matrices.* In: **Computer Algorithms for Solving Linear Algebra Equations: The State of the Art (NATO ASI Il Ciocco 1990)** E. Spedicato and M. T. Vespucci, Eds. Publishing Centre of the University of Bergamo, 1991, pp. 141-166.

[20] K. Gallivan and A. Sameh. *Matrix Computations on Shared-Memory Multiprocessors.* In: **The Application of Advanced Computing Concepts and Techniques in Control Engineering, NATO ASI SERIES**, M.J. Denham and A.J. Laub, Eds. Springer-Verlag, Berlin, 1988, pp. 289-359.

[21] K. Gallivan, W. Jalby, A. Malony and P.-C. Yew. *Performance Analysis on the CEDAR System.* In: **Performance Evaluation of Supercomputers**, J.L. Martin, Ed., Elsevier Science (North-Holland), Amsterdam, The Netherlands, 1988, pp. 109-142.

[22] C. W. Gear and K. Gallivan. *Automatic Methods for Highly Oscillatory Ordinary Differential Equations.* **Lecture Notes in Mathematics No. 912: Numerical Analysis**, A. Dold and B. Eckman, Eds., Springer-Verlag, Berlin, 1981, pp. 115-124.

Journal Articles (Refereed)

[23] D. S. Weile, E. Michielssen, and K. Gallivan. *Reduced-Order Modeling of Multiscreen Frequency Selective Surfaces Using Krylov-Based Rational Interpolation.* **IEEE Trans. on Antennas and Propagation**, Vol. 49, No. 5, pp. 801-813, May 2001.

[24] K. A. Gallivan and Paul Van Dooren. *Rational Approximations of Pre-filtered Transfer Functions*, **Numerical Algorithms**, No. 20, pp. 331-342, 1999.

[25] B. A. Marsolf, K. A. Gallivan, and H. A. G. Wijshoff. *The Utilization of Matrix Structure to Generate Optimized Code from MATLAB Programs*, **International Journal of Parallel Programming**, Vol. 27, No. 2, pp. 73-96, 1999.

[26] D. S. Weile and E. Michielssen and E. Grimme and K. Gallivan. *A Method for Generating Rational Interpolant Reduced Order Models of Two Parameter Systems*, **Applied Mathematics Letters**. Vol. 12, pp. 93–102, 1999.

[27] U. M. Yang and K. A. Gallivan. *A new family of block methods*, **Applied Numerical Mathematics**, Vol. 30, pp. 155–173, 1999.

[28] X. Wang, K. Gallivan, and R. Bramley. *CIMGS: An incomplete orthogonal factorization preconditioner.* **SIAM Journal of Scientific Computing**, Vol. 18, No. 2, pp. 516–536, 1997.

[29] K. A. Gallivan, B. A. Marsolf and H. A. G. Wijshoff. *Solving large nonsymmetric sparse linear systems using MCSPARSE*, **Parallel Computing**, Vol. 22, pp. 1291-1333, 1996.

[30] K. Gallivan, E. Gallopoulos and A. Sameh, *CEDAR: An experiment in parallel computing.* **Computer Mathematics and its Applications**, Vol. 1, No. 1, pp. 77-98, 1995.

[31] K. A. Gallivan, E. Grimme, and P. Van Dooren. *A Rational Lanczos Algorithm for Model Reduction.* **Numerical Algorithms**, Vol. 12, pp. 33–63, 1996.

[32] K. A. Gallivan, S. Thirumalai, V. Vermaut and P. Van Dooren. *High performance algorithms for Toeplitz and Block Toeplitz matrices.* **Linear Algebra and Its Applications**, Vol. 241–243, pp. 343–388, 1996.

[33] U. Meier Yang and K. A. Gallivan. *A new family of preconditioned iterative solvers for nonsymmetric linear systems* . **Applied Numerical Mathematics**, Vol. 19, pp. 287–317, 1995.

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