

Curriculum Vitae

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Personal Information

Birthdate June 18, 1962
Marital Status Married, two children
Nationality British (Permanent Resident, USA)

Academic Degrees

B.A. Mathematics, Churchill College, Cambridge 1984
M.Phil. Control Engineering & Operational Research, Churchill College, Cambridge, 1985
 Thesis: "Linear Programming and Minimum Weight Design – A Comparison of
 Methods for Solving a Class of Structural Optimization Problems."
M.A. Mathematics, Churchill College, Cambridge, 1988
Ph.D. Mathematical Programming, Churchill College, Cambridge, 1989
 Thesis: "Weak Sharp Minima & Penalty Functions in Mathematical Programming."

Professional Experience

1988– Professor 1998, Associate Professor 1994-98, Assistant Professor 1988-94,
 Computer Sciences and Industrial and Systems Engineering Departments,
 University of Wisconsin, Madison
2006– Professor (by courtesy) Mathematics Department, University of Wisconsin
06/03 Professeur Invité, Mathematics Department, University of Limoges, Limoges
2001-02 Guggenheim Fellow, Visiting Fellow, Exeter College, Oxford,
 and Visiting Professor, Oxford University Computing Laboratory
1988–2001 Member, Center for the Mathematical Sciences, University of Wisconsin
08/96, 12/98 Honorary Visiting Fellow, University of New South Wales, Sydney, Australia
1994–1995 Visiting Associate Professor, Department of Economics,
 University of Colorado, Boulder
07/89 Visiting Professor, Consiglio Nazionale Delle Ricerche,
 Istituto Di Analisi dei Sistemi ed Informatica, Rome
1980–81 Programmer, Programming Research Group,
 Oxford University Computing Laboratory, Oxford

Research Interests

Mathematical Programming, Modeling and Applications of Operations Research, Optimization in Medicine, Complementarity Problems, Grid Computation, Numerical Algorithms.

Professional Societies

Society for Industrial and Applied Mathematics, Institute for Operations Research and the Management Sciences, Mathematical Programming Society

Honours and Prizes

| | |
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| 2006 | Fellow of INFORMS |
| 2006 | Carolyn Rosner Excellent Educator Award, Computer Sciences Department, University of Wisconsin |
| 2004 | Sonoco Technology Award, Sonoco Products Company |
| 2002 | The William Pierskalla best paper award for research excellence in health care management science, Institute for Operations Research and the Management Sciences |
| 2001-02 | Guggenheim Fellowship |
| 1999-01 | Vilas Associate Award, University of Wisconsin |
| 1997 | Beale-Orchard-Hays Prize for Excellence in Computational Mathematical Programming, Mathematical Programming Society |
| 1994 | National Computational Science Award for Teaching Undergraduates, Department of Energy |
| 1991 | Presidential Young Investigators Award, National Science Foundation |
| 1986–87 | University of Wisconsin–Madison Chancellor’s Award |
| 1986 | Rayleigh Prize for Mathematics, Cambridge University |
| 1985 | Arthur Shercliff Memorial Prize, Cambridge University |
| 1984–88 | Science and Engineering Research Council Award, United Kingdom |
| 1984–85 | Churchill College Honorary Scholar, Cambridge University |
| 1984 | Wrangler, Mathematics, Cambridge University |

Professional Activities

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|---------------------|--|
| Chair | SIAM Activity Group on Optimization, (2008–10) |
| Executive Committee | Physical Sciences Division, University of Wisconsin (2005–08) |
| Co-Editor | Mathematical Programming (2001–present) |
| Associate Editor | SIAM Journal on Optimization (2002–present), Journal of Economic Dynamics and Control (2000–08), Optimization Methods and Software (1992–present), ACM Transactions on Mathematical Software (2004–present), Mathematical Programming (1997–2001), SIAM Journal on Control and Optimization (1992–97) |
| Editorial Board | MPS/SIAM Series on Optimization (2003–07), Communications on Applied Nonlinear Analysis (1994–present) |
| Member | INFORMS Nicholson Prize Committee (2008, Chair 2009), ICCOPT Steering Committee, Mathematical Programming Society (2008-09), INFORMS Dantzig Thesis Award Committee (2006-07), INFORMS Optimization Prize (2002), Beale-Orchard-Hays Prize Committee (2000), 1998 & 1999 Lanchester Prize Committees |
| Officer | Optimization Section of Institute for Operations Research and Management Sciences, 1997-98 (Vice-Chair), 1998-99 (Chair) |
| Referee | National Science Foundation; Department of Energy; Australian, British, Canadian, Dutch, Israeli, Norwegian and Swedish Research Councils. Various journals including SIAM Journal on Scientific Computing, Transportation Science, Applied Mathematics and Optimization, ORSA Journal on Computing, Computational Optimization and Applications, Mathematics of Operations Research, Naval Research Logistics Quarterly and Journal of Optimization Theory and Applications |

Grants and Patents

Principal Investigator on various research grants from NSF, DOE, AFOSR, NIH, Microsoft and GAMS Corp. U.S. Patent 6,868,452 “Method for caching of media files to reduce delivery cost”.

Conference and Session Organizer

Member of Program Committee, ISMP 2009, ICCOPT II, SIAM Meeting on Optimization (2008, 1999)

Co-organizer of International Conference on Complementarity Problems (1995, 1999, 2002, 2005)
Cluster chair at ORSA/TIMS and INFORMS meetings; organizer and co-organizer of two workshops and many technical sessions; session chair at numerous local and international meetings

Advisors and Advisees

Total number of Ph.D. students advised: 10

(S. Billups, M. Cao, Q. Chen, G. Deng, S. Dirkse, Q. Li, J.–H. Lim, T. Munson, K. Sinapiromsaran, M. Voelker)

Ph.D. and Master’s advisors: E. Anderson, A. Philpott

Recent Colloquia

Numerous invited talks at U.S. and foreign universities and professional meetings.

Publications

- [1] M. C. Ferris. Linear programming and minimum weight design – A comparison of methods for solving a class of structural optimization problems. Master’s thesis, University of Cambridge, Cambridge, 1985.
- [2] M. C. Ferris. *Weak Sharp Minima and Penalty Functions in Mathematical Programming*. PhD thesis, University of Cambridge, Cambridge, 1988.
- [3] M. C. Ferris and A. B. Philpott. On the performance of Karmarkar’s algorithm. *Journal of the Operational Research Society*, 39:257–270, 1988.
- [4] M. C. Ferris and A. B. Philpott. An interior point algorithm for semi–infinite linear programming. *Mathematical Programming*, 43:257–276, 1989.
- [5] M. C. Ferris. Weak sharp minima and penalty functions in mathematical programming. Technical Report 779, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1988.
- [6] M. C. Ferris. Finite termination of the proximal point algorithm. *Mathematical Programming*, 50:359–366, 1991.
- [7] M. C. Ferris. Iterative linear programming solution of convex programs. *Journal of Optimization Theory and Applications*, 65:53–65, 1990.
- [8] M. C. Ferris and O. L. Mangasarian. Finite perturbation of convex programs. *Applied Mathematics and Optimization*, 23:263–273, 1991.
- [9] M. C. Ferris. Parallel solution of extremely large knapsack problems. Technical Report 842, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1989.

- [10] J. V. Burke and M. C. Ferris. Characterization of solution sets of convex programs. *Operations Research Letters*, 10:57–60, 1991.
- [11] M. C. Ferris and O. L. Mangasarian. Minimum principle sufficiency. *Mathematical Programming*, 57:1–14, 1992.
- [12] E. J. Anderson and M. C. Ferris. Parallel genetic algorithms in optimization. In *Proceedings of the Fourth SIAM conference on Parallel Processing for Scientific Computing, Chicago, Illinois, December 11-13, 1989*.
- [13] M. C. Ferris and M. Vlach. Scheduling with earliness and tardiness penalties. *Naval Research Logistics Quarterly*, 39:229–245, 1992.
- [14] E. J. Anderson and M. C. Ferris. A genetic algorithm for the assembly line balancing problem. In *Proceedings of the Integer Programming / Combinatorial Optimization Conference, Waterloo, Ontario, Canada, May 28–30*. University of Waterloo Press, 1990.
- [15] M. C. Ferris and A. B. Philpott. On affine scaling and semi-infinite programming. *Mathematical Programming*, 56:361–364, 1992.
- [16] J. V. Burke, M. C. Ferris, and M. Qian. On the Clarke subdifferential of the distance function to a closed set. *Journal of Mathematical Analysis and its Applications*, 166:199–213, 1992.
- [17] M. Cao and M. C. Ferris. Genetic algorithms in optimization. *Journal of Undergraduate Mathematics and its Applications*, 12:81–90, 1991.
- [18] M. C. Ferris and O. L. Mangasarian. Parallel constraint distribution. *SIAM Journal on Optimization*, 1:487–500, 1991.
- [19] K. Bennett, M. C. Ferris, and Y. E. Ioannidis. A genetic algorithm for database query optimization. In R. K. Belew and L. B. Booker, editors, *Proceedings of the Fourth International Conference on Genetic Algorithms*, pages 400–407, San Mateo, California, 1991. Morgan Kaufmann Publishers, Inc.
- [20] M. C. Ferris. Parallel constraint distribution for convex quadratic programs. *Mathematics of Operations Research*, 19:645–658, 1994.
- [21] M. C. Ferris and S. Lucidi. Globally convergent methods for nonlinear equations. Technical Report 1030, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1991.
- [22] E. J. Anderson and M. C. Ferris. Genetic algorithms for combinatorial optimization: The assembly line balancing problem. *ORSA Journal on Computing*, 6:161–173, 1994.
- [23] J. V. Burke and M. C. Ferris. Weak sharp minima in mathematical programming. *SIAM Journal on Control and Optimization*, 31:1340–1359, 1993.
- [24] M. C. Ferris and O. L. Mangasarian. Error bounds and strong upper semicontinuity for monotone affine variational inequalities. *Annals of Operations Research*, 47:293–305, 1993.
- [25] S. P. Dirkse, M. C. Ferris, P. V. Preckel, and T. Rutherford. The GAMS callable program library for variational and complementarity solvers. Mathematical Programming Technical Report 94-07, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1994.

- [26] J. Eckstein and M. C. Ferris. Operator splitting methods for monotone linear complementarity problems. TMC 239, Thinking Machines Corporation, Cambridge, Massachusetts, 1992.
- [27] M. C. Ferris. The linear complementarity problem. *Bulletin of the American Mathematical Society*, 28:169–175, 1993.
- [28] M. Cao and M. C. Ferris. An interior point algorithm for monotone affine variational inequalities. *Journal of Optimization Theory and Applications*, 83:269–283, 1994.
- [29] M. Cao and M. C. Ferris. A pivotal method for affine variational inequalities. *Mathematics of Operations Research*, 21:44–64, 1996.
- [30] M. C. Ferris and S. Lucidi. Nonmonotone stabilization methods for nonlinear equations. *Journal of Optimization Theory and Applications*, 81:53–71, 1994.
- [31] M. C. Ferris and O. L. Mangasarian. Parallel variable distribution. *SIAM Journal on Optimization*, 4:815–832, 1994.
- [32] J. V. Burke and M. C. Ferris. A Gauss–Newton method for convex composite optimization. *Mathematical Programming*, 71:179–194, 1995.
- [33] S. P. Dirkse and M. C. Ferris. The PATH solver: A non-monotone stabilization scheme for mixed complementarity problems. *Optimization Methods and Software*, 5:123–156, 1995.
- [34] S. C. Billups and M. C. Ferris. Convergence of an infeasible interior–point algorithm from arbitrary positive starting points. *SIAM Journal on Optimization*, 6:316–325, 1996.
- [35] M. C. Ferris and J. S. Pang. Nondegenerate solutions and related concepts in affine variational inequalities. *SIAM Journal on Control and Optimization*, 34:244–263, 1996.
- [36] S. P. Dirkse and M. C. Ferris. MCPLIB: A collection of nonlinear mixed complementarity problems. *Optimization Methods and Software*, 5:319–345, 1995.
- [37] M. Cao and M. C. Ferris. P_C matrices and the linear complementarity problem. *Linear Algebra and Its Applications*, 246:299–312, 1996.
- [38] M. Cao and M. C. Ferris. Lineality removal for copositive–plus normal maps. *Communications on Applied Nonlinear Analysis*, 2:1–10, 1995.
- [39] S. P. Dirkse and M. C. Ferris. A pathsearch damped Newton method for computing general equilibria. *Annals of Operations Research*, pages 211–232, 1996.
- [40] M. C. Ferris and J. D. Horn. Partitioning mathematical programs for parallel solution. *Mathematical Programming*, 80:35–62, 1998.
- [41] M. C. Ferris and D. Ralph. Projected gradient methods for nonlinear complementarity problems via normal maps. In D. Du, L. Qi, and R. Womersley, editors, *Recent Advances in Nonsmooth Optimization*, pages 57–87. World Scientific Publishers, 1995.
- [42] S. C. Billups and M. C. Ferris. Solutions to affine generalized equations using proximal mappings. *Mathematics of Operations Research*, 24:219–236, 1999.
- [43] M. C. Ferris, S. Lucidi, and M. Roma. Nonmonotone curvilinear stabilization techniques for unconstrained optimization. *Computational Optimization and Applications*, 6:117–136, 1996.

- [44] J. Eckstein and M. C. Ferris. Operator splitting methods for monotone affine variational inequalities, with a parallel application to optimal control. *INFORMS Journal on Computing*, 10:218–235, 1998.
- [45] M. C. Ferris, A. Meeraus, and T. F. Rutherford. Computing Wardropian equilibrium in a complementarity framework. *Optimization Methods and Software*, 10:669–685, 1999.
- [46] M. C. Ferris and J. S. Pang. Engineering and economic applications of complementarity problems. *SIAM Review*, 39:669–713, 1997.
- [47] S. C. Billups and M. C. Ferris. QPCOMP: A quadratic program based solver for mixed complementarity problems. *Mathematical Programming*, 76:533–562, 1997.
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- [50] M. C. Ferris and O. L. Mangasarian. Breast cancer diagnosis via linear programming. *IEEE Computational Science and Engineering*, 2:70–71, 1995.
- [51] S. C. Billups, S. P. Dirkse, and M. C. Ferris. A comparison of large scale mixed complementarity problem solvers. *Computational Optimization and Applications*, 7:3–25, 1997.
- [52] S. P. Dirkse and M. C. Ferris. Crash techniques for large-scale complementarity problems. In M. C. Ferris and J. S. Pang, editors, *Complementarity and Variational Problems: State of the Art*, pages 40–61, Philadelphia, Pennsylvania, 1997. SIAM Publications.
- [53] F. Tin-Loi and M. C. Ferris. Holonomic analysis of quasibrittle fracture with nonlinear softening. In B. L. Karahaloo, Y. W. Mai, M. I. Ripley, and R. O. Ritchie, editors, *Advances in Fracture Research*, volume 2, pages 2183–2190, Oxford, 1997. Pergamon Press.
- [54] M. C. Ferris, M. P. Mesnier, and J. Moré. NEOS and Condor: Solving nonlinear optimization problems over the Internet. *ACM Transactions on Mathematical Software*, 26:1–18, 2000.
- [55] E. J. Anderson and M. C. Ferris. A direct search algorithm for optimization with noisy function evaluations. *SIAM Journal on Optimization*, 11:837–857, 2001.
- [56] M. C. Ferris and S. K. Zavriev. The linear convergence of a successive linear programming algorithm. Mathematical Programming Technical Report 96–12, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1996.
- [57] M. C. Ferris and J. S. Pang, editors. *Complementarity and Variational Problems: State of the Art*, Philadelphia, Pennsylvania, 1997. SIAM Publications.
- [58] J. Eckstein and M. C. Ferris. Smooth methods of multipliers for complementarity problems. *Mathematical Programming*, 86:65–90, 1999.

- [59] F. Tin-Loi and M. C. Ferris. A simple mathematical programming method for a structural identification problem. In *Seventh International Conference on Computing in Civil and Building Engineering (ICCCBE-VII), Seoul, Korea, 19-21 August*, pages 511–518, Korea, 1997. Techno-Press.
- [60] M. C. Ferris and A. Ruszczyński. Robust path choice in networks with failures. *Networks*, 35:181–194, 2000.
- [61] S. P. Dirkse and M. C. Ferris. Traffic modeling and variational inequalities using GAMS. In Ph. L. Toint, M. Labbe, K. Tanczos, and G. Laporte, editors, *Operations Research and Decision Aid Methodologies in Traffic and Transportation Management*, volume 166 of *NATO ASI Series F*, pages 136–163. Springer-Verlag, 1998.
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- [63] M. C. Ferris and T. S. Munson. Interfaces to PATH 3.0: Design, implementation and usage. *Computational Optimization and Applications*, 12:207–227, 1999.
- [64] M. C. Ferris and F. Tin-Loi. Nonlinear programming approach for a class of inverse problems in elastoplasticity. *Structural Engineering and Mechanics*, 6:857–870, 1998.
- [65] M. C. Ferris, R. Fourer, and D. M. Gay. Expressing complementarity problems and communicating them to solvers. *SIAM Journal on Optimization*, 9:991–1009, 1999.
- [66] M. C. Ferris and F. Tin-Loi. On the solution of a minimum weight elastoplastic problem involving displacement and complementarity constraints. *Computer Methods in Applied Mechanics and Engineering*, 174:107–120, 1999.
- [67] M. C. Ferris, C. Kanzow, and T. S. Munson. Feasible descent algorithms for mixed complementarity problems. *Mathematical Programming*, 86:475–497, 1999.
- [68] D. M. Shepard, M. C. Ferris, G. Olivera, and T. R. Mackie. Optimizing the delivery of radiation to cancer patients. *SIAM Review*, 41:721–744, 1999.
- [69] D. L. Eager, M. C. Ferris, and M. K. Vernon. Optimized regional caching for on-demand data delivery. In *Multimedia Computing and Networking, Proceedings of SPIE*, volume 3654, pages 301–316, Bellingham, Washington, 1999.
- [70] M. C. Ferris and T. S. Munson. Complementarity problems in GAMS and the PATH solver. *Journal of Economic Dynamics and Control*, 24:165–188, 2000.
- [71] M. C. Ferris and T. S. Munson. Modeling languages and Condor: Metacomputing for optimization. *Mathematical Programming*, 88:487–506, 2000.
- [72] D. L. Eager, M. C. Ferris, and M. K. Vernon. Optimized caching in systems with heterogeneous client populations. *Performance Evaluation*, 42:163–185, 2000.

- [73] M. C. Ferris and T. S. Munson. Case studies in complementarity: Improving model formulation. In M. Théra and R. Tichatschke, editors, *Ill-Posed Variational Problems and Regularization Techniques*, number 477 in Lecture Notes in Economics and Mathematical Systems, pages 79–98. Springer Verlag, Berlin, Germany, 1999.
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- [76] M. C. Ferris and T. S. Munson. Linear programming for emergency broadcast systems. *SIAG/OPT Newsletter*, 10:6–8, 1999.
- [77] M. C. Ferris and K. Sinapiromsaran. Formulating and solving nonlinear programs as mixed complementarity problems. In V. H. Nguyen, J. J. Strodiot, and P. Tossings, editors, *Optimization*, volume 481 of *Lecture Notes in Economics and Mathematical Systems*. Springer-Verlag, 2000.
- [78] M. C. Ferris and F. Tin-Loi. Limit analysis of frictional block assemblies as a mathematical program with complementarity constraints. *International Journal of Mechanical Sciences*, 43:209–224, 2001.
- [79] F. Tin-Loi and M. C. Ferris. Complementarity problems in engineering and mechanics: Models and solution. In C. M. Wang, K. H. Lee, and K. K. Ang, editors, *Computational Mechanics for the Next Millenium*, volume 2 of *Proceedings of APCOM '99, Fourth Asia-Pacific Conference on Computational Mechanics*, pages 1029–1036. Elsevier Science Ltd, 1999.
- [80] M. C. Ferris and R. R. Meyer. Models and solution for on-demand data delivery problems. In P. M. Pardalos, editor, *Approximation and Complexity in Numerical Optimization: Continuous and Discrete Problems*, volume 42 of *Nonconvex Optimization and its Applications*, pages 175–188. Kluwer Academic Publishers, Dordrecht, 2000.
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- [82] J.-C. De Bremaecker, M. C. Ferris, and D. Ralph. Compressional fractures considered as contact problems and mixed complementarity problems. *Engineering Fracture Mechanics*, 66:287–303, 2000.
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- [84] D. L. Eager, M. C. Ferris, and M. K. Vernon. Models for optimized regional caching in heterogeneous video-on-demand systems. Technical Report 1402, Computer Sciences Department, University of Wisconsin, Madison, Wisconsin, 1999.
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- [91] M. C. Ferris and D. M. Shepard. Optimization of Gamma Knife radiosurgery. In D.-Z. Du, P. Pardalos, and J. Wang, editors, *Discrete Mathematical Problems with Medical Applications*, volume 55 of *DIMACS Series in Discrete Mathematics and Theoretical Computer Science*, pages 27–44. American Mathematical Society, 2000.
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- [98] M. C. Ferris and M. M. Voelker. Slice models in general purpose modeling systems: An application to DEA. *Optimization Methods and Software*, 17:1009–1032, 2002.

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- [104] J.-C. De Bremaecker and M. C. Ferris. Numerical models of shear fracture propagation. *International Journal of Fracture*, 21:2161–2178, 2004.
- [105] H. Zhang, G. Wahba, Y. Lin, M. Voelker, M. Ferris, R. Klein, and B. Klein. Variable selection via basis pursuit for non-Gaussian data. In *2001 Proceedings of the American Statistical Association, Biometrics Section [CDROM]*, Alexandria, VA, 2001. American Statistical Association.
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