

CURRICULUM VITAE

Robert Michael Lewis

November 25, 2008

Robert Michael Lewis
Department of Mathematics
College of William and Mary

Education

Rice University	Computational and Applied Mathematics	Ph.D.	1989
Rice University	Computational and Applied Mathematics	M.S.	1988
Rice University	Mathematics	B.S.	1982

Professional Appointments

2008–	Wilson and Martha Stevens Term Distinguished Associate Professor, College of William & Mary
2006–	Associate Professor, Department of Mathematics, College of William & Mary
2000–	Assistant Professor, Department of Mathematics, College of William & Mary
1995–2000	Senior Staff Scientist, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center
1994–1995	Senior Software Engineer, Positron Corporation, Houston, Texas
1989–1994	Research Scientist, NSF Center for Research on Parallel Computation, Rice University

Honors, prizes, and awards

5.(a) Professional prizes, awards, and honors:

Simon Prize for Excellence in the Teaching of Mathematics, College of William and Mary, May 2006,

A. D. Welliver Fellow, Boeing Commercial Aircraft Group, 1995.

- 5.(b) Editorial positions on scholarly journals: none.
- 5.(c) Service on review boards outside of the College: none.
- 5.(d) Offices in professional societies: none.

Courses taught

- 6. Courses taught.
 - 1. Mathematics 104, Mathematics of Powered Flight: Spring 2009.
 - 2. Mathematics 106, Elementary Probability and Statistics: Fall 2000, Spring 2001, Fall 2001, Fall 2002, Spring 2003 (2 sections).
 - 3. Mathematics 150, Freshman Seminar: Spring 2008.
 - 4. Mathematics 212, Multivariable Calculus: Spring 2001.
 - 5. Mathematics 214, Foundations of Mathematics: Spring 2004, Fall 2008.
 - 6. Mathematics 413, Introduction to Numerical Analysis I: Fall 2003, Fall 2004, Fall 2005, Fall 2007.
 - 7. Mathematics 414, Introduction to Numerical Analysis II: Spring 2004, Spring 2005, Spring 2006, Spring 2009.
 - 8. Mathematics 441, Introduction to Applied Mathematics I: Fall 2001, Fall 2003.
 - 9. Mathematics 442, Introduction to Applied Mathematics II: Spring 2002
 - 10. Mathematics 490, Senior Seminar: Spring 2005.
 - 11. Mathematics 495, Honors: Fall 2004, Fall 2005.
 - 12. Computer Science 618, Models and Applications in Operations Research: Fall 2007.
 - 13. Computer Science 628, Linear Programming: Fall 2000, Fall 2002, Fall 2005.
 - 14. Computer Science 638, Nonlinear Programming: Spring 2002, Spring 2004.
 - 15. Computer Science 690, Readings in Computer Science: Fall 2001.

Fellowships and grants

7.(a) All fellowships, grants, contracts, &c., awarded by outside agencies (dates, sources, amounts)

Novel Approaches to Empirical Force Field Models in Molecular Modeling via Multidimensional Scaling, July 1, 2007–June 30, 2010, National Science Foundation DMS-0713812, \$133,759. With M. W. Trosset.

CSUMS: Theory, techniques, and research in computational mathematics, National Science Foundation, DMS-0703532. August 2007–June 2010, \$484,711. With C.-K. Li (PI), J. Shi, A. Stathopolous, and V. Torczon.

Multidisciplinary design optimization problem synthesis and solution, May 16, 2002–May 15, 2006, National Aeronautics and Space Administration, NCC-1-02029, \$67,707.

Using linearly constrained generating set search to solve nonlinear programming problems, June 15, 2005–September 15, 2005, Sandia National Laboratories, Contract #444632, \$10,571.

Progressing from linearly constrained pattern search to nonlinearly constrained pattern search, May 1, 2004–September 30, 2004, Sandia National Laboratories, Contract #270342, \$10,721.

Developing pattern search methods for constrained optimization, June 1, 2003–September 30, 2003, Sandia National Laboratories, Contract #152880, \$7,552.

Scientific computing research environments for the mathematical sciences, August 15, 2002–July 31, 2005, National Science Foundation, DMS-0215444, \$39,999 (with \$39,999 in matching funds and in-kind contributions from the College). With L. Leemis, R. Mathias, and M. W. Trosset.

Pattern search for nonlinear optimization, March 16, 2001–August 31, 2002, Sandia National Laboratories, Contract #17291, \$15,744.

Proteomics Software for Cancer Diagnostics, \$358,459. National Institutes of Health SBIR Phase II subcontract to W&M. Other W&M investigators include W. Cooke, E. R. Tracy, and M. W. Trosset.

Pending: None.

Declined:

Proximity visualization via multidimensional scaling: efficient algorithms and applications, submitted to the Division of Computer and Communication Foundations, National Science Foundation, \$379,599. With Andreas Stathopolous and Michael Trosset.

Collaborative Research: Efficient Methods for Nonconvex Spectral Optimization in Distance Geometry, submitted December 2004 to the Division of Mathematical Sciences, National Science Foundation, \$312,285. With C.-K. Li and M. W. Trosset. P. Tarazaga, Texas A&M–Corpus Christi, submitted a separate collaborative proposal.

A Quantitative View of the Role of Dynamics of Proteins and Nucleic Acids in Molecular Recognition, submitted February 2003 to the National Science Foundation Frontiers in Integrative Biological Research program, \$3,779,082. With R. Vold, G. Varani, G. Drobny, G. Hoatson, M. W. Trosset, and A. F. D’Amare.

Collaborative Research: Multigrid Optimization Methods for Discretized Design Problems, submitted December 2001 to the Division of Mathematical Sciences, National Science Foundation, \$104,201.00. S. G. Nash, George Mason University, submitted a separate collaborative proposal.

7.(b) All summer grants and Faculty Research Assignments received from William & Mary, with dates awarded: none.

Research

8. Scholarly activity under the following separate headings with full bibliographic data (including page numbers).

(a) Refereed publications in periodicals, chapters in books, law review articles, and conference proceedings.

- [1] J. D. GRIFFIN, T. G. KOLDA, AND R. M. LEWIS, *Asynchronous parallel generating set search for linearly-constrained optimization*, SIAM Journal on Scientific Computing, 30 (2008), pp. 1892–1924.
- [2] R. M. LEWIS, A. SHEPHERD, AND V. TORCZON, *Implementing generating set search methods for linearly constrained minimization*, SIAM Journal on Scientific Computing, 29 (2007), pp. 2507–2530.
- [3] T. G. KOLDA, R. M. LEWIS, AND V. TORCZON, *Stationarity results for generating set search for linearly constrained optimization*, SIAM Journal on Optimization, 17 (2006), pp. 943–968.
- [4] R. M. LEWIS AND M. W. TROSSET, *Sensitivity analysis of the strain criterion for multidimensional scaling*, Computational Statistics and Data Analysis, 50 (2006), pp. 135–153.

- [5] R. M. LEWIS AND S. G. NASH, *Model problems for the multigrid optimization of systems governed by differential equations*, SIAM Journal on Scientific Computing, 26 (2005), pp. 1811–1837.
- [6] N. M. ALEXANDROV AND R. M. LEWIS, *Reconfigurability in MDO problem synthesis, part 2*, in Proceedings of the 10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Albany, New York, August 30–September 1, 2004. AIAA–2004–4308.
- [7] N. M. ALEXANDROV AND R. M. LEWIS, *Reconfigurability in MDO problem synthesis, part 1*, in Proceedings of the 10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Albany, New York, August 30–September 1, 2004. AIAA–2004–4307.
- [8] T. G. KOLDA, R. M. LEWIS, AND V. TORCZON, *Optimization by direct search: New perspectives on some classical and modern methods*, SIAM Review, 45 (2003), pp. 385–482.
- [9] E. D. DOLAN, R. M. LEWIS, AND V. J. TORCZON, *On the local convergence properties of pattern search*, SIAM Journal on Optimization, 14 (2003), pp. 567–583.
- [10] N. M. ALEXANDROV AND R. M. LEWIS, *Dynamically reconfigurable approach to multidisciplinary problems*, in Proceedings of the 16th AIAA Computational Fluid Dynamics Conference, Orlando, Florida, June 23–26, 2003. AIAA–2003–3431.
- [11] R. M. LEWIS AND S. G. NASH, *Practical aspects of multiscale optimization methods for VLSICAD*, in Multilevel Optimization in VLSICAD, J. Cong and J. R. Shinnerl, eds., vol. 14 of Combinatorial Optimization, Springer, 2003, pp. 265–291.
- [12] L. HUYSE, S. L. PADULA, R. M. LEWIS, AND W. LI, *Probabilistic approach to free-form airfoil shape optimization under uncertainty*, AIAA Journal, 40 (2002), pp. 1764–1772.
- [13] R. M. LEWIS AND V. TORCZON, *A globally convergent augmented Lagrangian pattern search algorithm for optimization with general constraints and simple bounds*, SIAM Journal on Optimization, 12 (2002), pp. 1075–1089.
- [14] N. M. ALEXANDROV AND R. M. LEWIS, *Analytical and computational aspects of collaborative optimization for multidisciplinary design*, AIAA Journal, 40 (2002), pp. 301–309.
- [15] N. M. ALEXANDROV, R. M. LEWIS, C. R. GUMBERT, L. L. GREEN, AND P. A. NEWMAN, *Approximation and model management in aerodynamic optimization with variable-fidelity models*, Journal of Aircraft, 38 (2001), pp. 1093–1101.

- [16] N. M. ALEXANDROV AND R. M. LEWIS, *An overview of first-order model management for engineering optimization*, Optimization and Engineering, 2 (2001), pp. 413–430.
- [17] R. M. LEWIS AND S. G. NASH, *A multigrid approach to the optimization of systems governed by differential equations*, in Proceedings of the 8th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Long Beach, California, September 6–8, 2000. AIAA–2000–4890.
- [18] N. M. ALEXANDROV, E. J. NIELSEN, R. M. LEWIS, AND W. K. ANDERSON, *First-order model management with variable-fidelity physics applied to multi-element airfoil optimization*, in Proceedings of the 8th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Long Beach, California, September 6–8, 2000. AIAA–2000–4886.
- [19] N. M. ALEXANDROV AND R. M. LEWIS, *Algorithmic perspectives on problem formulations in MDO*, in Proceedings of the 8th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization (Long Beach, CA, September 6–8, 2000), 2000. AIAA paper 2000–4719.
- [20] N. M. ALEXANDROV AND R. M. LEWIS, *Analytical and computational properties of distributed approaches to MDO*, in Proceedings of the 8th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Long Beach, California, September 6–8, 2000. AIAA–2000–4718.
- [21] N. M. ALEXANDROV, R. M. LEWIS, C. R. GUMBERT, L. L. GREEN, AND P. A. NEWMAN, *Optimization with variable-fidelity models applied to wing design*, in Proceedings of the 38th AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 10–13, 2000. AIAA–2000–0841. Also available as ICASE Report No. 99–49, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia.
- [22] R. M. LEWIS, V. TORCZON, AND M. W. TROSSET, *Direct search methods: Then and now*, Journal of Computational and Applied Mathematics, 124 (2000), pp. 191–207.
- [23] C. A. KENNEDY, M. H. CARPENTER, AND R. M. LEWIS, *Low-storage, explicit Runge-Kutta schemes for the compressible Navier–Stokes equation*, Applied and Numerical Mathematics, 35 (2000), pp. 315–357.
- [24] R. M. LEWIS AND V. TORCZON, *Pattern search methods for linearly constrained minimization*, SIAM Journal on Optimization, 10 (2000), pp. 917–941.
- [25] R. M. LEWIS, A. T. PATERA, AND J. PERAIRE, *A posteriori finite element bounds for sensitivity derivatives of partial-differential-equation outputs*, Finite Elements in Analysis and Design, 34 (2000), pp. 271–290.

- [26] R. M. LEWIS AND V. TORCZON, *Pattern search algorithms for bound constrained minimization*, SIAM Journal on Optimization, 9 (1999), pp. 1082–1099.
- [27] R. M. LEWIS, *Using sensitivity information in the construction of kriging models for design optimization*, in Proceedings of the 7th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, St. Louis, Missouri, September 2–4, 1998. AIAA–1998–4799.
- [28] N. ALEXANDROV, J. E. DENNIS, JR., R. M. LEWIS, AND V. TORCZON, *A trust region framework for managing the use of approximation models in optimization*, Structural and Multidisciplinary Optimization, 15 (1998), pp. 16–23.
- [29] R. M. LEWIS, *A trust region framework for managing approximation models in engineering optimization*, in Proceedings of the 6th AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization, Bellevue, Washington, September 4–6, 1996. AIAA–1996–4101.
- [30] E. J. CRAMER, J. E. DENNIS, JR., P. D. FRANK, R. M. LEWIS, AND G. R. SHUBIN, *Problem formulation for multidisciplinary design optimization*, SIAM Journal on Optimization, 4 (1994), pp. 754–776.
- [31] J. E. DENNIS, JR. AND R. M. LEWIS, *Problem formulations and other optimization issues in multidisciplinary optimization*, in Proceedings of the 25th AIAA Symposium on Fluid Dynamics, Colorado Springs, Colorado, June 20–23, 1994. AIAA–94–2196. Also available as Technical Report TR94–16, Department of Computational and Applied Mathematics, Rice University, Houston, Texas.
- [32] R. M. LEWIS, *Cardinal interpolating multiresolutions*, Journal of Approximation Theory, 76 (1994), pp. 177–202.
- [33] E. J. CRAMER, J. E. DENNIS, JR., P. D. FRANK, R. M. LEWIS, AND G. R. SHUBIN, *On alternative problem formulations for multidisciplinary design optimization*, in Proceedings of the Fourth AIAA/USAF/NASA/OAI Symposium on Multidisciplinary Analysis and Optimization, 1992, pp. 518–530. AIAA–1992–4752.
- [34] R. M. LEWIS AND W. W. SYMES, *On the relation between the velocity coefficient and boundary value for solutions of the one-dimensional wave equation*, Inverse Problems, 7 (1991), pp. 597–631.

(b) Books written. None

(c) Edited volumes. None.

(d) Edited non-refereed publications

- [1] R. M. LEWIS AND S. G. NASH, *Factors affecting the performance of optimization-based multigrid methods*, in Multiscale Optimization Methods and Applications, W. W. Hager, S.-J. Huang, P. M. Pardalos, and O. A. Prokopyev, eds., vol. 82 of Nonconvex Optimization and Its Applications, Springer, 2005, pp. 151–172.
- [2] R. M. LEWIS AND M. W. TROSSET, *Optimization methods*, in Encyclopedia of Statistics in Behavioral Science, B. S. Everitt and D. C. Howell, eds., vol. 3, John Wiley & Sons, 2005.
- [3] N. M. ALEXANDROV AND R. M. LEWIS, *First-order variable-fidelity model management: analysis and performance*, in Large-Scale PDE-Constrained Optimization, vol. 30 of Lecture Notes in Computational Science and Engineering, Springer-Verlag, 2003, pp. 63–79.
- [4] L. HUYSE AND R. M. LEWIS, *Aerodynamic shape optimization of two-dimensional airfoils under uncertain conditions*, Tech. Report 2001–01, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia, 2001.
- [5] N. M. ALEXANDROV AND R. M. LEWIS, *First-order frameworks for managing models in engineering optimization*, in Proceedings of the First International Workshop on Surrogate Modelling and Space Mapping for Engineering Optimization, Lyngby, Denmark, November 16–18, 2000.
- [6] R. M. LEWIS, *The adjoint approach in a nutshell*, SIAG/OPT Views-and-News: A Forum for the SIAM Activity Group on Optimization, 11 (2000), pp. 9–11.
- [7] N. M. ALEXANDROV AND R. M. LEWIS, *Comparative properties of collaborative optimization and other approaches to MDO*, in Proceedings of the First ASMO UK/ISSMO Conference on Engineering Design Optimization, Ilkley, England, 1999. Available as ICASE Report No. 99–24,, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia.
- [8] R. M. LEWIS, V. TORCZON, AND M. W. TROSSET, *Why pattern search works*, Optima, 59 (1998), pp. 1–7.
- [9] R. M. LEWIS, *Numerical computation of sensitivities and the adjoint approach*, in Computational Methods for Optimal Design and Control, J. Borggaard, J. Burns, E. Cliff, and S. Schreck, eds., Birkhäuser, 1998, pp. 285–302. Also available as ICASE Report No. 97–61, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton Virginia.
- [10] R. M. LEWIS, *Practical aspects of variable reduction formulations and reduced basis algorithms in multidisciplinary design optimization*, in Multidisciplinary Design Optimization: State of the Art, N. Alexandrov and M. Y. Hussaini, eds., Philadelphia, 1997,

SIAM, pp. 172–188. Also available as ICASE Report No. 95–76, Institute for Computer Applications in Science and Engineering, NASA Langley Research Center, Hampton, Virginia.

(e) Invited scholarly papers and talks

- [1] *Assessing the performance of a multigrid method for optimization*, Second International Conference on Continuous Optimization, McMaster University, Hamilton, ON, August 2007. Invited talk.
- [2] *Extensions of classical multidimensional scaling for molecular embedding problems*, INFORMS Annual Meeting, Pittsburgh, PA, November 2006. Minisymposium talk.
- [3] *Approximation and model management*, Third MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 2005. Invited talk.
- [4] *Experience with an implementation of a generating set search method for linearly constrained optimization*, SIAM Conference on Optimization, Stockholm, Sweden, May 2005. Minisymposium talk.
- [5] *Implementation of generating set search methods*, Fifth International Conference on Optimization, University of Lisbon, Lisbon, Portugal, July 2004. Invited talk.
- [6] *A multigrid approach to the optimization of systems governed by PDE*, Second Sandia Workshop on PDE-Constrained Optimization, Santa Fe, NM, May 2004. Invited poster presentation.
- [7] *Approximation of the reduced hessian for systems governed by p.d.e. and domain decomposition*, SIAM Conference on Parallel Processing, San Francisco, CA, February 2004. Minisymposium talk.
- [8] *Sensitivity analysis of the strain criterion*, DIMACS Working Group Meeting on Algorithms for Multidimensional Scaling, Gainesville, FL, June 2003. Invited talk.
- [9] *Multigrid and domain decomposition in the optimization of systems governed by PDE*, Numerical Techniques for Optimization with PDE Constraints, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, February 2003. Invited talk.
- [10] *Challenges in simulation-based optimization*, SIAM Conference on Computational Science and Engineering, San Diego, CA, February 2003. Minisymposium talk.
- [11] *Why multigrid can be effective in optimization*, Computer Science Research Institute, Sandia National Laboratories, August 2002. Colloquium talk.
- [12] *Length-scale effects in the optimization of systems governed by differential equations*, SIAM Conference on Optimization, Toronto, ON, May 2002. Minisymposium talk.

- [13] *Levels of discretization and the optimization of systems governed by differential equations*, Multilevel Optimization in VLSICAD, Institute for Pure and Applied Mathematics, University of California at Los Angeles, December 2001. Invited talk.
- [14] *A multigrid method for the optimization of systems governed by differential equations*, Department of Mathematics, Old Dominion University, November 2001. Colloquium talk.
- [15] *Multigrid methods for the optimization of systems governed by differential equations*, Numerical Analysis Seminar, Department of Mathematics, University of California at San Diego, October 2001. Seminar talk.
- [16] *What is adjoint about the adjoint approach?*, Sensitivity Analysis Workshop, Lawrence Livermore National Laboratories, August 2001. Invited talk.
- [17] *Levels of discretization and the optimization of systems governed by differential equations*, First Sandia Workshop on Large-Scale PDE-Constrained Optimization, Santa Fe, NM, April 2001. Invited talk.
- [18] *Pattern search methods for nonlinear programming*, Computer Science Research Institute, Sandia National Laboratories, March 2001. Colloquium talk.
- [19] *Levels of discretization and the optimization of systems governed by differential equations*, SIAM Conference on Computational Science and Engineering, Washington, DC, September 2000. Minisymposium talk.
- [20] *Derivatives in optimization problems governed by differential equations*, Department of Computational and Applied Mathematics, Rice University, November 1997. Colloquium talk.
- [21] *Approximations in engineering optimization: A nonlinear programming perspective*, Department of Operations Research and Systems Engineering, George Mason University, April 1997. Colloquium talk.

(f) Contributed scholarly papers and talks

- [1] *Attacking the nonconvexity of graph embedding directly, with application to molecular conformation*, SIAM Conference on Optimization, Boston, MA, May 2008. Minisymposium talk.
- [2] *Assessing the performance of a multigrid method for optimization*, Sixth International Congress on Industrial and Applied Mathematics, Zürich, Switzerland, July 2007. Minisymposium talk.

- [3] *Reconfigurability in MDO problem synthesis*, Tenth AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Albany, NY, September 2004. Contributed talk.
- [4] *Analytical and computational properties of distributed approaches to MDO*, Eighth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Design, Long Beach, CA, September 2000. Contributed talk.
- [5] *Using a posteriori error analysis in optimization*, SIAM Conference on Optimization, Atlanta, GA, May 1999. Contributed talk.
- [6] *Using sensitivity information in the construction of surrogates for design optimization*, Seventh AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Design, St. Louis, MO, September 1998. Contributed talk.
- [7] *Sensitivity calculations for problems governed by PDE from a nonlinear programming perspective*, AFOSR Workshop on Optimal Design, Arlington, VA, September 1997. Contributed talk.
- [8] *The qualitative nature of Hessians for optimization problems governed by partial differential equations*, 16th International Symposium on Mathematical Programming Lausanne, Switzerland, August 1997. Contributed talk.
- [9] *A trust region framework for managing the use of first-order approximation models in engineering optimization*, INFORMS, Seattle, WA, November 1996. Contributed talk.
- [10] *A trust region framework for managing the use of approximation models in engineering optimization*, Sixth AIAA/NASA/ISSMO Symposium on Multidisciplinary Analysis and Design, Seattle, WA, September 1996. Contributed talk.
- [11] *Applications of a bilevel algorithm to systems governed by PDE*, SIAM Conference on Optimization, Victoria, BC, May 1996. Contributed talk.
- [12] *Practical aspects of variable reduction formulations and reduced basis methods in multidisciplinary design optimization*, ICASE/NASA Langley Workshop on Multidisciplinary Design Optimization, Hampton, VA, March 1995. Contributed talk.
- [13] *Nonlinear programming approaches to parameter identification for flow in porous media*, SIAM Conference on Optimization, Chicago, IL, May 1993. Contributed talk.
- [14] *Optimal well placement and management*, 16th Symposium on Operations Research, Universität Trier, Germany, September 1991. Contributed talk.
- [15] *Parallelism in the coherency optimization method*, SIAM Conference on Parallel and Distributed Computing, Chicago, IL, December 1989. Contributed talk.

- (g) Reviews of books, software, &c.
- (h) Juried shows, exhibitions, and performances
- (i) Unjuried shows, exhibitions, and performances
- (k) Research reports from grant or contract work
- (l) Commercial implementations of algorithms you have developed

The direct search algorithms for bound and linearly constrained optimization in The MathWorks' Matlab Genetic Algorithms and Direct Search Toolbox are based on my work.

My work on approximation and model management is incorporated in Sandia National Laboratories' DAKOTA framework for design optimization, parameter estimation, uncertainty quantification, and sensitivity analysis.

- (m) Published software, audio, multimedia, &c., materials
- (n) Work in progress or submitted

- [1] R. M. LEWIS AND V. TORCZON, *Active set identification without derivatives*. Submitted to SIAM Journal on Scientific Computing, 2008.
- [2] I. G. GROOMS, R. M. LEWIS, AND M. W. TROSSET, *Molecular embedding via a second-order dissimilarity parameterized approach*, December 2006. In revision for SIAM Journal on Scientific Computing.

- (o) Other scholarly activity, including papers presented at professional meetings and publications of abstracts.

Workshop on Protein Folding, Institute for Mathematics and its Applications, University of Minnesota, January 2008.

Research week on New Algorithms for Inferring Molecular Structure from Distance Restraints, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, January 2004. Invited participant.

Workshop on Optimization in Simulation-based Models, Institute for Mathematics and its Applications (IMA), University of Minnesota, January 2003. Invited participant.

Professional service

- (a) College committee service:
 - Admissions Committee (Fall 2008–),
 - Software committee for the College's notebook initiative (Fall 2004–Spring 2005).

(b) Other professional service not included in item 5 above.

Reviewer for professional journals: *SIAM Journal on Control*, *SIAM Journal on Numerical Analysis*, *SIAM Journal on Optimization*, *Mathematical Programming*, *Operations Research*, *Optimization and Engineering*, *Journal of Approximation Theory*, *Applied Mathematics Letters*, *Computational Operations Research*, *Geophysics*, *Journal of Computational and Graphical Statistics*, *Computers and Geophysics*, *Optimization: Methods and Software*.

Reviewer for a preliminary draft for the book series *MPS–SIAM Series on Optimization*.

Reviewer for research proposals to: the National Science Foundation, the Department of Energy, and the National Aeronautics and Space Administration.

Departmental service:

Chief undergraduate advisor, Fall 2007–present.

Chair, undergraduate curriculum committee, Fall 2008–present.

Department computer committee, Fall 2000–present.

Faculty adviser to Mathematics Organization for Students (MOST), Fall 2001–Spring 2005.

Search committee, position in arguably applied mathematics, 2007–2008 academic year.

Search committee, position in operations research, 2005–2006 academic year.

Search committee, position in applied mathematics, 2002–2003 academic year.

Search committee, position in computational mathematics, 2001–2002 academic year.

Honors projects directed:

Matt Ruprecht Fall 2005

Ian Grooms Fall 2004

Committee member for honors projects:

Kristina Hoffman Department of Mathematics 2005

George Zagarias Department of Computer Science 2005

Benjamin Cox Department of Computer Science 2004

Kyle Wisian Department of Physics 2004

Michael Levy Department of Mathematics 2003

Samuel Small Department of Computer Science 2003

Matthew Schu Department of Physics 2003

Jeanine Cole Department of Chemistry 2002

Matthew Kirwan Department of Geology 2002

Paul Goger Department of Mathematics 2001

Other educational activities:

Short courses on using Matlab in mathematics courses and research, Hampton University, October 18, 2003 and April 2, 2005. These workshops for college faculty from Tidewater Virginia and northeast North Carolina were organized by Professor Arun Verma, Hampton University, under the U.S. Department of Education program *Effective Mathematics Instruction using Symbolic-computation Technology*.

Short course on parallel optimization, prepared at the invitation of the Center for Research on Parallel Computation, Rice University. Presented at the Air Force Institute of Technology, Wright-Patterson AFB, May 1997, and at the Center for Research on Parallel Computation, May 1997.