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# Dianne Prost O'Leary

## Distinguished University Professor, Emerita

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### I. Personal Information

#### 1. *Personal Data*

Born November 20, 1951, Chicago, Illinois  
Married, 3 children

#### 2. *Educational Background*

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|-------------------------------------------------------------|------------|
| B. S. (Mathematics major, Physics minor), Purdue University | June 1972  |
| Ph.D. (Computer Science), Stanford University               | April 1976 |

#### 3. *Employment Background*

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| Distinguished University Professor, Emerita, University of Maryland                                      | 2014-          |
| Distinguished University Professor, University of Maryland                                               | 2014           |
| Professor, Computer Science Department, University of Maryland                                           | 1988-2014      |
| Sabbatical 1984-85 NBS                                                                                   |                |
| Sabbatical 1991-92 IMA, Univ. of Minnesota                                                               |                |
| Sabbatical 1998-99 NIST and ETH, Zürich, Switzerland                                                     |                |
| Sabbatical 2005-06 NIST and CCS                                                                          |                |
| Sabbatical 2013 NIST                                                                                     |                |
| Professor, Institute for Advanced Computer Studies, University of Maryland                               | 1988-2014      |
| Affiliate Professor, Department of Electrical and Computer Engineering, University of Maryland           | 2007-2014      |
| Associate Professor, Computer Science Department, University of Maryland                                 | 1982-1988      |
| Associate Professor, Institute for Advanced Computer Studies, University of Maryland                     | 1985-1988      |
| Assistant Professor, Computer Science Department, University of Maryland                                 | 1978-1982      |
| Assistant Professor, Institute for Physical Science and Technology, University of Maryland               | 1978-1981      |
| Mathematician (consultant) National Institute of Standards and Technology (National Bureau of Standards) | 1978-2015      |
| Assistant Professor, Mathematics Department, University of Michigan                                      | 1975-1978      |
| Teaching Assistant, Computer Science Department, Stanford University                                     | 1974           |
| Computer Programmer at a commercial data processing bureau                                               | Sum 1969, 1970 |
| Computer Programmer at a university computing center                                                     | Summer, 1971   |

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## II. Research and Scholarly Activities

(My students are marked with asterisks and my postdoctoral fellows are marked with daggers. Other students and postdoctoral fellows are marked with a plus sign.) The publications are organized by field at <http://www.cs.umd.edu/users/oleary/res12/>.

### Books Authored

- [B2] Dianne P. O’Leary, *Scientific Computing with Case Studies*, SIAM Press, Philadelphia, 2009.
- [B1] Per Christian Hansen, James G. Nagy, and Dianne P. O’Leary, *Deblurring Images: Matrices, Spectra, and Filtering*, SIAM Press, Philadelphia, 2006.

### Books Edited

- [A3] Misha E. Kilmer and Dianne P. O’Leary, eds., *G. W. Stewart: Selected Works with Commentaries*, Birkhauser Press, 2010.
- [A2] Raymond H. Chan, Chen Greif, and Dianne P. O’Leary, eds., *Milestones in Matrix Computation: Selected Works of Gene H. Golub, with Commentaries*, Oxford University Press, 2007.
- [A1] George Cybenko, Dianne P. O’Leary, and Jorma Rissanen, eds., *The Mathematics of Information Coding, Extraction and Distribution*, IMA Volumes in Math. and Its Applics., Springer-Verlag, New York, 1999.

### Refereed Journal Publications

- [J114] M. Paul Laiu<sup>+</sup>, Cory D. Hauck, Ryan G. McClarren, Dianne P. O’Leary, and André L. Tits, “Positive Filtered  $P_N$  Moment Closures for Linear Kinetic Equations,” *SIAM Journal on Numerical Analysis*, 54(6) 3214–3238. <https://doi.org/10.1137/15M1052871>
- [J113] Viktoria Taroudaki\* and Dianne P. O’Leary, “Near-Optimal Spectral Filtering and Error Estimation for Solving Ill-Posed Problems,” *SIAM Journal on Scientific Computing*, 37(6) (2016), A2947–A2968. <http://dx.doi.org/10.1137/15M1019581>
- [J112] Julianne M. Chung, Misha E. Kilmer, and Dianne P. O’Leary, “A Framework for Regularization via Operator Approximation,” *SIAM J. on Scientific Computing*, 37(2), B332–B359. (28 pages). <http://dx.doi.org/10.1137/130945363>
- [J111] Sungwoo Park\* and Dianne P. O’Leary, “A Polynomial Time Constraint Reduced Algorithm for Semidefinite Optimization Problems,” *Journal of Optimization Theory and Applications*, February 2015 <http://dx.doi.org/10.1007/s10957-015-0714-z>
- [J110] Julianne M. Chung, Matthias Chung, and Dianne P. O’Leary, “Optimal Regularized Low-Rank Inverse Approximation,” *Linear Algebra and Its Applications*, 468(1) (2015), pp. 260–269. <http://dx.doi.org/10.1016/j.laa.2014.07.024>
- [J109] H. Roitner, M. Haltmeier, R. Nuster, D. P. O’Leary, T. Berer, G. Paltauf, H. Grün, and P. Burgholzer, “Deblurring Algorithms Accounting for the Finite Detector Size in Photoacoustic Tomography,” *Journal of Biomedical Optics*, 19(5) (2014). <http://dx.doi.org/10.1117/1.JBO.19.5.056011>
- [J108] Graham Alldredge<sup>+</sup>, Cory D. Hauck, Dianne P. O’Leary, and André L. Tits, “Adaptive Change of Basis in Entropy-Based Moment Closures for Linear Kinetic Equations”, *Journal of Computational Physics*, 258, pp. 489–508 (2014). <http://dx.doi.org/10.1016/j.jcp.2013.10.049>

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- [J107] Dianne P. O’Leary and Bert W. Rust, “Variable Projection for Nonlinear Least Squares Problems,” *Computational Optimization and Applications*, 54, pp. 579–593 (2013) <http://dx.doi.org/10.1007/s10589-012-9492-9>
- [J106] Joseph P. Bockhorst, John M. Conroy, Shashank Agarwal, Dianne P. O’Leary, and Hong Yu, “Beyond Captions: Linking Figures with Abstract Sentences in Biomedical Articles,” *PLoS ONE*, PLoS ONE, 7(7): e39618 (2012) <http://dx.doi.org/10.1371/journal.pone.0039618>
- [J105] Julianne M. Chung<sup>†</sup>, Matthias Chung, and Dianne P. O’Leary, “Optimal Filters from Calibration Data for Image Deconvolution with Data Acquisition Errors,” *Journal of Mathematical Imaging and Vision*, 44(3), pp. 366–374 (2012) <http://dx.doi.org/10.1007/s10851-012-0332-4>
- [J104] Haw-ren Fang\* and Dianne P. O’Leary, “Euclidean Distance Matrix Completion Problems,” *Optimization Methods and Software*, Available on-line: December 2011 <http://dx.doi.org/10.1080/10556788.2011.643888>
- [J103] Julianne M. Chung<sup>†</sup>, Glenn R. Easley, and Dianne P. O’Leary, “Windowed Spectral Regularization of Inverse Problems,” *SIAM Journal on Scientific Computing*, 33(6) (2011) 3175–3200. <http://dx.doi.org/10.1137/100809787>
- [J102] Julianne M. Chung<sup>†</sup>, Matthias Chung, and Dianne P. O’Leary, “Designing Optimal Spectral Filters for Inverse Problems,” *SIAM Journal on Scientific Computing*, 33(6) (2011) 3132–3152. <http://dx.doi.org/10.1137/100812938>
- [J101] Luke B. Winternitz<sup>+</sup>, Stacey O. Nicholls\*, André Tits, and Dianne P. O’Leary, “A Constraint-Reduced Variant of Mehrotra’s Predictor-Corrector Algorithm” *Computational Optimization and Applications*, 51(1) (2012) 1001–1036. (on-line 19 January 2011) <http://dx.doi.org/10.1007/s10589-010-9389-4>
- [J100] Konstantin Berlin\*, Dianne P. O’Leary, and David Fushman, “Fast Approximations of the Rotational Diffusion Tensor and Their Application to Structural Assembly of Molecular Complexes,” *Proteins: Structure, Function, and Bioinformatics*, 79(7) (2011) 2268–2281. <http://dx.doi.org/10.1002/prot.23053>
- [J99] John M. Conroy, Judith D. Schlesinger, and Dianne P. O’Leary, “Nouveau-ROUGE: A Novelty Metric for Update Summarization”, *Computational Linguistics*, 37(1) (2011). [http://dx.doi.org/10.1162/coli\\_a\\_00033](http://dx.doi.org/10.1162/coli_a_00033)
- [J98] Sungwoo Park\* and Dianne P. O’Leary, “Implicitly-Weighted Total Least Squares,” *Linear Algebra and Its Applications*, (posted June 2010) 435(3) 2011, 560–577 <http://dx.doi.org/10.1016/j.laa.2010.06.020> <http://dx.doi.org/10.1016/j.laa.2010.06.020>
- [J97] Jin Hyuk Jung\*, Dianne P. O’Leary, and André L. Tits, “Adaptive Constraint Reduction for Convex Quadratic Programming,” *Computational Optimization and Applications*, (March 2010) 33 pages. (Online First) 51(1) (2012) 125–157./ <http://dx.doi.org/10.1007/s10589-010-9324-8>
- [J96] Sungwoo Park\* and Dianne P. O’Leary, “Portfolio Selection Using Tikhonov Filtering to Estimate the Covariance Matrix” *SIAM Journal on Financial Mathematics*, 1 (2010) 932–961. <http://dx.doi.org/10.1137/090749372>
- [J95] Konstantin Berlin\*, Dianne P. O’Leary, and David Fushman, “Structural Assembly of Molecular Complexes Based on Residual Dipolar Couplings,” *Journal of the American Chemical Society*, 132(26) (2010) 8961–8972. <http://dx.doi.org/10.1021/ja100447p>

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- [J94] Konstantin Berlin\*, Dianne P. O’Leary, and David Fushman, “Improvement and Analysis of Computational Methods for Prediction of Residual Dipolar Couplings,” *Journal of Magnetic Resonance* 201 (2009) 25–33. <http://dx.doi.org/10.1016/j.jmr.2009.07.028>
- [J93] Simon P. Schurr\*, Dianne P. O’Leary, and André L. Tits, “A Polynomial-Time Interior-Point Method for Conic Optimization, with Inexact Barrier Evaluations,” *SIAM Journal on Optimization*, 20 (2009) 548–571. <http://dx.doi.org/10.1137/080722825>
- [J92] Michael J. O’Hara\* and Dianne P. O’Leary, “Quadratic Fermionic Interactions Yield Hamiltonians with Large Ground-State Energy Gaps,” *Physical Review A*, 79:3 (2009) 032331 (10 pages). <http://dx.doi.org/10.1103/PhysRevA.79.032331> <http://link.aps.org/abstract/PRA/v79/e032331> Chosen for inclusion in *Virtual Journal of Quantum Information* 9:4 (2009).
- [J91] Stephen S. Bullock<sup>+</sup> and Dianne P. O’Leary, “Locality Bounds on Hamiltonians for Stabilizer Codes,” *Quantum Information and Computation*, 9 (2009) 0487–0499. <http://www.rintonpress.com/journals/qiconline.html#v9n34>
- [J90] Jin Hyuk Jung\*, Dianne P. O’Leary, and André L. Tits, “Adaptive Constraint Reduction for Training Support Vector Machines,” *Electronic Transactions on Numerical Analysis*, 31 (2008) 156–177. <http://etna.mcs.kent.edu/vol.31.2008/pp156-177.dir/pp156-177.pdf>
- [J89] Jin Hyuk Jung\* and Dianne P. O’Leary, “Implementing an Interior Point Method for Linear Programs on a CPU-GPU System,” *Electronic Transactions on Numerical Analysis*, 28 (2008) 174–189. <http://etna.mcs.kent.edu/vol.28.2007-2008/pp174-189.dir/pp174-189.pdf>
- [J88] Elena Zotenko\*, Julian Mestre, Dianne P. O’Leary, and Teresa M. Przytycka, “Why Do Hubs in the Yeast Protein Interaction Network Tend to be Essential: Re-examining the Connection between the Network Topology and Essentiality,” *PLoS Computational Biology*, 4(8):e1000140 (2008) (16 pages) <http://dx.doi.org/10.1371/journal.pcbi.1000140> Highlighted in *Nature Reviews Genetics*. Selected for highlights track presentation at 17th Annual International Conference on Intelligent Systems for Molecular Biology (ISMB), Stockholm, Sweden, 2009.
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- [J86] Michael J. O’Hara\* and Dianne P. O’Leary, “The Adiabatic Theorem in the Presence of Noise,” *Physical Review A*, 77 (2008) 042319, 20 pages. <http://dx.doi.org/10.1103/PhysRevA.77.042319> Chosen for inclusion in *Virtual Journal of Applications of Superconductivity* 14:9 (2008) and *Virtual Journal of Quantum Information* 8:5 (2008).
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- [J84] Elena Zotenko\*, Rezarta Islamaj Dogan, W. John Wilbur, Dianne P. O’Leary, and Teresa M. Przytycka, “Structural Footprinting in Protein Structure Comparison: The Impact of Structural Fragments,” *BMC Structural Biology*, (2007) 7:53 <http://dx.doi.org/10.1186/1472-6807-7-53>
- [J83] Haw-ren Fang\* and Dianne P. O’Leary, “Modified Cholesky Algorithms: A Catalog with New Approaches,” *Mathematical Programming A*, 2007. <http://dx.doi.org/10.1007/s10107-007-0177-6>
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- [J74] Anoop Kalsi\* and Dianne P. O’Leary, “Fast Algorithms for Structured Least Squares and Total Least Squares Problems,” *Journal of Research of the National Institute of Standards and Technology*, 111, No. 2 (2006) pp. 113-119. <http://nvl.nist.gov/pub/nistpubs/jres/111/2/V111.N02.A06.pdf>
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- [J71] Stephen S. Bullock<sup>+</sup>, Dianne P. O’Leary, and Gavin K. Brennen<sup>+</sup>, “Asymptotically Optimal Quantum Circuits for  $d$ -level Systems,” *Physical Review Letters* 94, no 23 (2005) 230502, 4 pages. <http://dx.doi.org/10.1103/PhysRevLett.94.230502> Chosen for inclusion in *Virtual Journal of Quantum Information* 5:6 (2005). <http://xxx.lanl.gov/abs/quant-ph/0410116>
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<http://dx.doi.org/10.1016/j.cma.2004.06.028>
- [J67] Nicola Mastronardi, Phillip Lemmerling, Anoop Kalsi\*, Dianne O’Leary, and Sabine Van Huffel, “Implementation of the Regularized Structured Total Least Squares Algorithms for Blind Image Deblurring,” *Linear Algebra and Its Applications*, 391 (2004) 203-221. <http://dx.doi.org/10.1016/j.laa.2004.07.006>
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- [J57] Misha E. Kilmer\* and Dianne P. O’Leary, “Choosing Regularization Parameters in Iterative Methods for Ill-Posed Problems,” *SIAM J. on Matrix Analysis and Applications*, 22 (2001) 1204-1221.  
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- [J55] Weichung Wang\* and Dianne P. O’Leary, “Adaptive Use of Iterative Methods in Predictor-Corrector Interior Point Methods for Linear Programming,” *Numerical Algorithms*, (special issue honoring Richard Varga), 25 (2000) 387-406.
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- [J48] Tamara G. Kolda\* and Dianne P. O’Leary, “A Semi-Discrete Matrix Decomposition for Latent Semantic Indexing in Information Retrieval,” *ACM Transactions on Information Systems* 16 (1998) 322-346.
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- [C38] Bert W. Rust, Dianne P. O’Leary, and Katharine M. Mullen, “Modelling Type 1a Supernova Light Curves,” Chapter 8 in *Exponential Data Fitting and Its Applications*, V. Pereyra and G. Scherer, eds., Bentham Science Publishers Ltd. 2010, pp. 169-186. <http://www.bentham.org/ebooks/9781608050482/>
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- [C35] Nitin Madnani<sup>+</sup>, Rebecca Passonneau, Necip Fazil Ayan<sup>+</sup>, John M. Conroy, Bonnie J. Dorr, Judith L. Klavans, Dianne P. O’Leary, and Judith D. Schlesinger, “Measuring Variability in Sentence Ordering for News Summarization,” 11th European Workshop on Natural Language Generation (ENLG07) Schloss Dagstuhl, Germany, June 17-20, 2007.
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- [C32] John M. Conroy, Dianne P. O’Leary, and Judith D. Schlesinger, “CLASSY Arabic and English Multi-Document Summarization”, in *Multi-Lingual Summarization Evaluation 2006*, <http://www.isi.edu/~cyl/MTSE2006/MSE2006/papers/index.html>, 2006.
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- [C22] Lynn Carlson, John M. Conroy, Daniel Marcu, Dianne P. O’Leary, Mary Ellen Okurowski, Anthony Taylor, and William Wong, “An Empirical Study of the Relation between Abstracts, Extracts, and the Discourse Structure of Texts,” *DUC 01 Conference Proceedings*, 2001. <http://duc.nist.gov/>
- [C21] J. M. Conroy, J. D. Schlesinger, D. P. O’Leary, and M. E. Okurowski, “Using HMM and Logistic Regression to Generate Extract Summaries for DUC,” *DUC 01 Conference Proceedings*, 2001. <http://duc.nist.gov/>
- [C20] Dianne P. O’Leary and Scott T. Weidman, “The Interface between Computer Science and the Mathematical Sciences,” *Computing in Science and Engineering* Vol 3 No 3 May/June 2001, 60-65.
- [C19] Dianne P. O’Leary and Scott T. Weidman, “The Interface of Three Areas of Computer Science with the Mathematical Sciences,” National Academy Press, Washington, DC, 2000. <http://www.nap.edu/books/NI000351/html/>
- [C18] Tamara G. Kolda\* and Dianne P. O’Leary, “Latent Semantic Indexing via a Semi-Discrete Matrix Decomposition,” in *The Mathematics of Information Coding, Extraction and Distribution*, George Cybenko, Dianne P. O’Leary, and Jorma Rissanen, eds., IMA Volumes in Math. and Its Applics., Springer-Verlag, New York, 1999, 73–80.
- [C17] Per Christian Hansen and Dianne P. O’Leary, “Regularization Algorithms Based on Total Least Squares,” in *Recent advances in total least squares techniques and errors-in-variables modeling (Leuven, 1996)*, SIAM, Philadelphia, 1997, 127–137.
- [C16] James G. Nagy and Dianne P. O’Leary, “Fast Iterative Image Restoration with a Spatially Varying PSF,” in *Advanced Signal Processing Algorithms, Architectures, and Implementations VII* F. T. Luk, ed., SPIE, 1997, 388–399.
- [C15] Dianne P. O’Leary, “The SVD in Image Restoration,” *SVD and Signal Processing III: Algorithms, Architectures, and Applications*, Marc Moonen and Bart DeMoor, eds., Elsevier, New York, 1995, 315-322.
- [C14] D. P. Heyman and Dianne P. O’Leary, “What is Fundamental for Markov Chains: First Passage Times, Fundamental Matrices, and Group Generalized Inverses,” *Proceedings of the Second International Workshop on Markov Chains*, W. Stewart, ed., Kluwer Academic Publishers, 1995, 151-161.
- [C13] Dianne P. O’Leary, “Parallel Computing: Emerging from a Time Warp,” *IEEE Computational Science & Engineering* 1:4 (1994) 1,15.
- [C12] Dianne P. O’Leary, “Regularization of Ill-Posed Problems in Image Restoration,” *Proceedings of the Fifth SIAM Conference on Applied Linear Algebra*, J.G. Lewis, ed., SIAM Press, Philadelphia, 1994, 102-105.

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- [C11] Richardo Fierro, Gene H. Golub, Per Christian Hansen, and Dianne P. O’Leary, “Regularization by Truncated Total Least Squares,” *Proceedings of the Fifth SIAM Conference on Applied Linear Algebra*, J.G. Lewis, ed., SIAM Press, Philadelphia, 1994, 250-254.
- [C10] K.J.R. Liu, Dianne P. O’Leary, G.W. Stewart, and Yuan-Jye J. Wu\*, “An Adaptive ESPRIT Based on URV Decomposition,” *International Conference on Acoustics, Speech, and Signal Processing (ICASSP-93)*, Vol. IV, 37-40.
- [C09] (invited) Dianne P. O’Leary, “Iterative Methods for Finding the Stationary Vector for Markov Chains,” *Linear Algebra, Markov Chains, and Queuing Models (IMA, January 1992)*, Carl Meyer and Robert Plemmons, eds., Springer-Verlag, IMA Volumes in Math. and Its Applics. Vol. 48 New York, 1993, 125-136.
- [C08] M. Monahemi<sup>+</sup>, J. Barlow and Dianne P. O’Leary, “On the Precise Loop Transfer Recovery and Transmission Zeroes,” *First IEEE Conference on Control Applications*, Dayton, Ohio, September 1992.
- [C07] Chiou-Ming Huang\* and Dianne P. O’Leary, “Preconditioning Parallel Multisplittings for Solving Linear Systems of Equations,” *International Conference on Supercomputing (Washington, DC, July 1992)* ACM Press, New York, 1992, 478-484.
- [C06] M. Monahemi<sup>+</sup>, J. Barlow, and Dianne P. O’Leary, “Considerations on Loop Transfer Recovery for Non-minimum Phase Plants,” *Proceedings of the AIAA Aircraft Design Systems and Operations Meeting*, Baltimore, September 1991, AIAA-91-3086.
- [C05] M. Monahemi<sup>+</sup>, J. Barlow, and Dianne P. O’Leary, “The Design of Reduced Order Luenberger Observers with Precise LTR,” *Proceedings of the AIAA Meeting on Guidance, Navigation and Control* New Orleans, August 1991, AIAA-91-2731.
- [C04] Dianne P. O’Leary, G.W. Stewart and Robert van de Geijn<sup>+</sup>, “Domino: A Transportable System for Parallel Processing,” in *Parallel Processing and Medium-Scale Multiprocessors* (Proceedings of a 1986 Conference), Arthur Wouk (Ed.), SIAM Press, Philadelphia (1989) 25-34.
- [C03] (invited, extended abstract) Dianne P. O’Leary, “Fine and Medium Grained Parallel Algorithms for Matrix QR Factorization,” *Algorithms and Applications on Vector and Parallel Computers*, H.J.J. te Riele, Th.J. Dekker and H.A. van der Vorst, eds., Elsevier Science Publishers B.V. (North Holland), (1987) 347-349.
- [C02] Dianne P. O’Leary, “Linear programming problems arising from partial differential equations,” in *Sparse Matrix Proceedings 1978*, Iain S. Duff and G. W. Stewart (Eds.) SIAM Press, Philadelphia (1979) 25-40.
- [C01] (Invited paper) Paul Concus, Gene H. Golub, and Dianne P. O’Leary, “A generalized conjugate gradient method for the numerical solution of elliptic partial differential equations,”  
in *Sparse Matrix Computations*, James R. Bunch and Donald J. Rose (Eds.) Academic Press, New York (1976) 309-332.  
reprinted in *Studies in Numerical Analysis*, Gene H. Golub (Ed.), Volume 25 of Studies in Mathematics, The Mathematical Association of America (1984) 178-198.

### Technical Reports and Other Publications

- [T21] Roozbeh Yousefzadeh and Dianne P. O’Leary, “Auditing and Debugging Deep Learning Models via Decision Boundaries: Individual-level and Group-level Analysis,” January 2020. <https://arxiv.org/abs/2001.00682>

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- [T20] Roozbeh Yousefzadeh\* and Dianne P. O’Leary, “A Probabilistic Framework and a Homotopy Method for Real-Time Hierarchical Freight Dispatch Decisions,” December 2019. <https://arxiv.org/pdf/1912.03733.pdf>
- [T19] Roozbeh Yousefzadeh\* and Dianne P. O’Leary, “Investigating Decision Boundaries of Trained Neural Networks,” August 2019. <https://arxiv.org/pdf/1908.02802.pdf>
- [T18] Roozbeh Yousefzadeh\* and Dianne P. O’Leary, “Refining the Structure of Neural Networks Using Matrix Conditioning,” August 2019. <https://arxiv.org/pdf/1908.02400.pdf>
- [T17] Roozbeh Yousefzadeh\* and Dianne P. O’Leary, “Interpreting Neural Networks Using Flip Points,” March 2019. <https://arxiv.org/pdf/1903.08789.pdf>
- [T16] Jin Hyuk Jung\* and Dianne P. O’Leary, “Exploiting Structure of Symmetric or Triangular Matrices on a GPU,” Computer Science Department Report CS-TR-4914, Institute for Advanced Computer Studies Report UMIACS-TR-2008-12, January 2008. <http://hdl.handle.net/1903/7984>
- [T15] Daniel M. Dunlavy\* Dianne P. O’Leary, John M. Conroy, and Judith D. Schlesinger, “QCS: A System for Querying, Clustering, and Summarizing Documents,” SANDIA Technical Report SAND2006-5000, July 2006.
- [T14] David E. Gilsinn, Geraldine S. Cheok, Dianne P. O’Leary, “Deconvolving LADAR Images of Bar Codes for Construction Site Object Recognition, NISTIR-7044, National Inst. of Standards and Technology, Gaithersburg, MD, 2003.
- [T13] John Conroy and Dianne P. O’Leary, “Text Summarization via Hidden Markov Models and Pivoted QR Matrix Decomposition,” Computer Science Department Report CS-TR-4221, Institute for Advanced Computer Studies Report UMIACS-2001-11, University of Maryland, February 2001.
- [T12] James G. Nagy and Dianne P. O’Leary, “Displaying Confidence Images,” Computer Science Department Report CS-TR-4161, Institute for Advanced Computer Studies Report UMIACS-2000-51, University of Maryland, July 2000.
- [T11] D. O’Leary, H. Park, A. H. Sayed, P. N. Shivakumar, “Preface,” Linear Algebra and Its Applications Special Issue: Proceedings of the International Linear Algebra Society (ILAS) Symposium on Fast Algorithms for control, Signals, and Image Processing (6-8 June 1997), Winnipeg, Canada, 284 (1998) 1
- [T10] Per Christian Hansen and Dianne P. O’Leary, “Regularization Algorithms Based on Total Least Squares,” Computer Science Department Report CS-TR-3684, Institute for Advanced Computer Studies Report UMIACS-TR-96-65, University of Maryland, September 1996.
- [T09] Dianne P. O’Leary, “First Birthday for AWM-Net,” AWM Newsletter, Vol. 25, No. 2, March-April 1995, p. 22.
- [T08] Chiou-Ming Huang\* and Dianne P. O’Leary, “A Parallel Inexact Newton Method Using a Krylov Multisplitting Algorithm,” Computer Science Department Report CS-TR-3112, Institute for Advanced Computer Studies Report UMIACS-93-71, University of Maryland, July 1993.
- [T07] Dianne P. O’Leary, Roger Pierson, G. W. Stewart, and Mark Weiser, “The Maryland Crab: A module for building parallel computers,” Computer Science Department Report CS-1660, Institute for Advanced Computer Studies Report UMIACS-86-9, University of Maryland, April, 1986.

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- [T06] Dianne P. O’Leary, G. W. Stewart and R. van de Geijn<sup>+</sup>, “DOMINO: A message passing system for parallel computation,” Computer Science Department Report CS-1648, University of Maryland, April, 1986.
- [T05] Dianne P. O’Leary, “Solving sparse matrix problems on parallel computers,” Computer Science Department Report TR-1234, University of Maryland (1982).
- [T04] Dianne P. O’Leary, “Some mathematics of image processing” *SIAM News* November 15, 1982 p6.
- [T03] Dianne P. O’Leary, “Sparse quadratic programming without matrix updating,” Computer Science Department Report TR-1200, University of Maryland (1982).
- [T02] Dianne P. O’Leary, “Linear Programming Practice and Pitfalls,” Engineering Summer Conference on Operations Research, Course Notes, University of Michigan, Summer 1976, 1977, 1978.
- [T01] Dianne P. O’Leary, “Hybrid conjugate gradient algorithms,” Ph.D. Thesis, Computer Science Department Report STAN-CS-76-548, Stanford University (1976).

### Invited Lectures

- [S56] Dianne P. O’Leary, “One Picture and a Thousand Words, Using Matrix Approximations,” Householder Lecture at Oak Ridge National Laboratory, October 2017.
- [S55] Dianne P. O’Leary, “Approximating Matrices: One Picture and One Thousand Words,” Keynote address at Hong Kong Baptist University Workshop in Memory of Gene Golub, February 2017.
- [S54] Dianne P. O’Leary, Approximating Matrices: One Picture and One Thousand Words Boeing Distinguished Colloquium at University of Washington, October 2016
- [S53] Dianne P. O’Leary, “Image Restoration and Uncertainty Quantification,” plenary talk, 25th Biennial Numerical Analysis Conference Glasgow, Scotland, June 2013.
- [S52] Dianne P. O’Leary, Eckart-Young Meets Bayes: Optimal Regularized Low-Rank Inverse Approximation, plenary talk, ILAS 2013 Meeting, (International Linear Algebra Society), Providence, RI, June 2013.
- [S51] Dianne P. O’Leary, “Tracking Objects Using Wavelets and Shearlets,” February Fourier Talks, University of Maryland, February 2013.
- [S50] Dianne P. O’Leary, “Divide and Conquer: Using Spectral Methods on Partitioned Images,” SIAM Conference on Imaging Science, Philadelphia, May 2012.
- [S49] Dianne P. O’Leary, “Image Restoration from a Machine Learning Perspective,” 2012 Cray Distinguished Speaker for the Computer Science Department, University of Minnesota. April, 2012.
- [S48] “Confidence in Image Reconstruction,” IMA Workshop on Large-scale Inverse Problems and Quantification of Uncertainty, Minneapolis, MN June 2011
- [S47] “Where am I? Position from Incomplete Distance Information,” Householder Symposium, Lake Tahoe, CA, June 2011.
- [S46] “Where am I? Position from Incomplete Distance Information,” Purdue University, April 2011.
- [S45] 2011 Norbert Wiener Lecturer for Tufts University. Delivered three lectures, one for a very broad audience, one at the level of a colloquium, and one more specialized: “Computer Science in Words and Images,” “Where am I? Position from Incomplete Distance Information,” “Uncertainty Quantification for Ill-Posed Problems.”

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- [S44] “Mathematics and Computer Science in Words and Images,” Women in Science Forum, Towson University, March 2011.
- [S43] “Confidence and Misplaced Confidence in Image Reconstruction,” SIAM Applied Linear Algebra Meeting, Monterey, California, October 2009.
- [S42] “Validating Approximate Solutions to Ill-Posed Problems,” Washington-Baltimore Section of the Society for Industrial and Applied Mathematics Meeting, College Park, Maryland, May 2009
- [S41] “Optimization Methods for Image Deblurring,” NASA Goddard Space Flight Center IS&T Colloquium, April, 2009.
- [S40] “A Noisy Adiabatic Theorem and Implications for Quantum Computing,” Scientific Computing and Advanced Computing Session, sponsored by the AMS Mathematical Research Community, at the AMS Joint Math Meetings, Washington, DC, January 2009.
- [S39] “Web Searches: Queries, Clusters, and Summaries,” Computer Science Distinguished Speakers Series, College of William and Mary, Williamsburg, VA, November 2008.
- [S38] “A Noisy Adiabatic Theorem: Wilkinson Meets Schrödinger’s Cat,” Sonia Kovalevsky Lecture, SIAM Annual Meeting, San Diego, CA, July 2008.
- [S37] “Residual Periodograms for Ill-Posed Problems,” 17th Householder Symposium, Zeuthen, Germany, June 2008.
- [S36] “Mining Multilingual Documents,” (a keynote talk) 8th SIAM International Conference on Data Mining, Atlanta, Georgia, April 2008.
- [S35] “Speeding the Training of Support Vector Machines and Solution of Quadratic Programs,” Harrochov, Czech Republic, August 2007.
- [S34] “Parallel Matrix Computation: From the ILLIAC to Quantum Computing,” Stanford 50: State of the Art and Future Directions of Computational Mathematics and Numerical Computing, March, 2007.
- [S33] “Matrix Factorizations for Information Retrieval,” Workshop on Modern Massive Datasets, Stanford, California, June 2006.
- [S32] “Multi-Success,” Convocation Address, University of Waterloo, October 2005.
- [S31] “HOPE: A Homotopy Optimization Method for Protein Structure Prediction,” University of Waterloo, October 2005.
- [S30] “Some Linear Algebra of Quantum Computing,” Sandia National Laboratory, Livermore, CA, September 28, 2005.
- [S29] “Numerical Linear Algebra in Image Deblurring,” Third International School in Numerical Linear Algebra and Applications, Monopoli, Italy, September 11-17, 2005.
- [S28] “Math in Words and Images,” Math SPIRAL (Summer Program In Research And Learning) for undergraduate students from a variety of schools, mostly HBCU’s, University of Maryland, 2003, 2005, 2007.
- [S27] “8 Rules for Career Success,” ALL-WIE Symposium, IEEE Women in Engineering Washington Area Affinity Group, Lanham, Maryland, May 2003.
- [S26] “Blind Deconvolution Algorithms,” IPAM/SIAM/EMS Conference on “Applied Inverse Problems”. Lake Arrowhead, California, May 2003.

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- [S25] “Towards Understanding the Convergence of the Krylov Subspace Methods,” Latsis Symposium 2002, ETH Zurich, Switzerland, February 2002.
- [S24] “The Linear Algebra of Image Processing,” Seventh SIAM Conference on Applied Linear Algebra, Raleigh, NC, October, 2000.
- [S23] “Computing and Displaying Confidence Intervals for Images,” AMW-AWM-SIAM Special Session on Linear Algebra and Optimization, Joint Mathematics Meetings, Washington, DC January 21, 2000.
- [S22] “Computational Science and Engineering’s Relation to Applied Mathematics,” Invited address at the IEEE Workshop on Computational Science and Engineering, Lafayette, Indiana, October 1996.
- [S21] “Conjugate Gradients: Images, Parallelism, and Preconditioning” Invited speaker at the AMS/SIAM Meeting on Linear and Nonlinear Conjugate Gradient-Related Methods, Seattle, Washington, July 1995.
- [S20] “Computation with Markov Chains,” Plenary speaker at the SIAM National Meeting, San Diego, California, July 1994.
- [S19] Invited speaker at the Computer Research Association “Windows of Opportunity Symposium for Female Students in Computing,” Washington, D.C., May 1993.
- [S18] “The Block Quasi-Newton Algorithm,” Plenary speaker at the International Linear Algebra Society Conference on Pure and Applied Linear Algebra, Pensacola, Florida, March 1993.
- [S17] “Iterative Methods for Solving Markov Chains,” Workshop on Linear Algebra, Markov Chains, and Queuing Problems, Institute for Mathematics and Its Applications, University of Minnesota, Minneapolis, January 1992.
- [S16] “Regularizing Iterations for the Solution of Discrete Ill-Posed Problems,” Numerical Linear Algebra Conference, Mathematisches Forschungsinstitut Oberwolfach, Germany, April, 1991.
- [S15] “Techniques for Improving the Accuracy of Solutions to Linear Least Squares Problems,” US/Finnish Workshop on Scientific Computing, Espoo, Finland, August, 1989.
- [S14] “Some Small Problems in Parallel Processing,” Gatlinburg X Meeting on Numerical Linear Algebra, Fairfield Glade, Tennessee, October, 1987.
- [S13] “The Block Conjugate Gradient Algorithm in Parallel Computing,” International Conference on Vector and Parallel Computing, Loen, Norway, June, 1986.
- [S12] “Fine and Medium Grained Parallel Algorithms for Matrix QR Factorization,” Stichting Mathematisch Centrum, Centrum voor Wiskunde en Informatica, Amsterdam, The Netherlands, May, 1986.
- [S11] “Parallel Computation and Linear Programming,” Workshop on Future Directions in Mathematical Programming, Naval Postgraduate School, Monterey, California, February, 1986.
- [S10] “A Testbed for Parallel Algorithm Development,” Second SIAM Meeting on Parallel Processing and Numerical Analysis, Norfolk, Virginia, November, 1985.
- [S09] “Solution of Matrix Problems on Parallel Computers,” Gatlinburg IX Meeting on Numerical Linear Algebra, Waterloo, Ontario, Canada, July, 1984.

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- [S08] “Data-flow Algorithms for Matrix Computations,” ACM SIGNUM Conference on Numerical Computations and Mathematical Software for Microcomputers (minisymposium), Boulder, Colorado, March, 1984.
  - [S07] “Parallel Computations for Sparse Linear Systems,” SIAM 1983 Fall Meeting (minisymposium), Norfolk, Virginia, November, 1983.
  - [S06] “Solving Mesh Problems on Parallel Processors,” Sparse Matrix Symposium, Fairfield Glade, Tennessee, October 1982.
  - [S05] “Linear Algebra in Digital Image Processing,” SIAM Conference on Applied Linear Algebra, Raleigh, North Carolina, April 1982.
  - [S04] “Ill-posed Toeplitz Systems,” Gatlinburg VIII Meeting on Numerical Linear Algebra, Oxford, England, July 1981.
  - [S03] “The Block Conjugate Gradient Algorithm,” Gatlinburg VII Meeting on Numerical Linear Algebra, Monterey, California, December 1977.
  - [S02] “The Block Conjugate Gradient Algorithm,” Symposium on Applied Matrix Methods, Johns Hopkins University, August, 1977.
  - [S01] “Conjugate Gradient Convergence Acceleration Methods for Elliptic Partial Differential Equations,” Symposium on Sparse Matrix Computations, Argonne, Illinois, September, 1975 (With Gene H. Golub and Paul Concus).

### **Grant Support**

- [G22] National Science Foundation Grant DMS-1016266, 2010-2014: “Confidence and Misplaced Confidence in Image Reconstruction.”
- [G21] Department of Energy Grant DESC0001862, 2009-2013: “Advanced Optimization Techniques for Entropy-Based Moment Closures,” (With A. Tits and C. Hauck)
- [G20] Department of Energy Grant DESC0002218, 2009-2013: “Interior-Point Algorithms for Optimization Problems with Many Constraints,” (With A. Tits)
- [G19] National Science Foundation Grant CCF-0514213, 2005-2009: “Computations with Unitary Matrices,” (With G. W. Stewart).
- [G18] Department of Energy Grant DEFG0204ER25655, 2004-2009: “Interior Point Algorithms for Optimization Problems,” (with A. Tits).
- [G17] National Science Foundation Grant, 2004-2008: “HP and Visualization Cluster,” (co-PI, with A. Varshney et al.)
- [G16] Department of Energy Grant DEFG0203ER25555, 2003-2004: “Workshop on Women of Applied Mathematics: Research and Leadership,”
- [G15] National Science Foundation Grant ITR, 2002-2005: “Fast Multipole Translation Algorithms for Solution of the 3D Helmholtz Equation,” (with R. Duraiswami, H. Elman, N. Gumerov, I. Mayergoyz).
- [G14] National Science Foundation Grant CCR-0204084, 2002-2005: “New Krylov Methods: Theory and Applications,” (With G. W. Stewart).

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- [G13] Office of Naval Research Grant N000140110181, 2000-2003: “Solution Algorithms and Probabilistic Analysis of Models and Scattering,” (With Howard Elman).
- [G12] National Science Foundation Grant CCR-97-32022, 1998-2001: “Numerical Methods for Ill-Posed Problems and Large scale Eigenvalue Problems,” (With G. W. Stewart).
- [G11] National Science Foundation Grant, 1999, “Support of Householder Symposium XIV on Numerical Algebra.” (With G. W. Stewart)
- [G10] National Science Foundation Grant CCR-95-03126, 1995-1998: “Numerical Methods for Ill-Posed Problems and Markov Chains” (With G. W. Stewart).
- [G09] Office of Naval Research Grant N00014-94-10580, 1995-1997, “Numerical Methods for Underwater Structural Acoustics Simulations” (With H. Elman, J. Saltz, and G.W. Stewart).
- [G08] NSF CISE Research Infrastructure Award, National Science Foundation, 1994-1997: “Systems and Software Tools for High Performance Computing” (With L. S. Davis, H. Elman, J. Hendler, and J. Saltz)
- [G07] National Science Foundation Grant 95-1120-8721, 1996, “Support of Householder Symposium XIII on Numerical Algebra.”
- [G06] Office of Naval Research Grant N00014-94-10580, 1994-1995, “Numerical Methods for Underwater Structural Acoustics Simulations” (With H. Elman, J. Saltz, and G.W. Stewart).
- [G05] National Science Foundation Grant CCR-91-15568, 1992-1995: “The Numerical Treatment of Markov Chains” (With G. W. Stewart).
- [G04] Air Force Office of Scientific Research Grant AFOSR-82-0078 and AFOSR-87-0188, 1982-92: “Parallel Matrix Computation” (With G. W. Stewart).
- [G03] National Science Foundation Grant MCS-79-23422, 1980-84: “Representation and control in computer vision: multi- level relaxation approaches” (With A. Rosenfeld).
- [G02] Office of Naval Research Grant N00014-76-C-0391, 1979-1982, “Research in numerical linear algebra” (With G. W. Stewart).
- [G01] National Science Foundation Grant MCS 76-06595, 1976-1978: “Conjugate gradient algorithms for nonlinear elliptic equations” and “Linear programming problems arising from partial differential equations”.

### Awards and Achievements

Celebration on the Occasion of the Retirement of Dianne O’Leary at the SIAM Conference on Applied Linear Algebra, October 2015, Atlanta, Georgia.

2012 Cray Distinguished Speaker for the Computer Science Department, University of Minnesota.

“Portfolio Selection Using Tikhonov Filtering to Estimate the Covariance Matrix,” by graduate student Sungwoo Park and Dianne P. O’Leary, winner of the 2011 SIAM Student Paper Competition.

2011 Norbert Wiener Lecturer for Tufts University.

Named a SIAM Fellow, 2009 (inaugural group).

Outstanding Authorship Award, Best Journal Paper of the Year, Information Technology Laboratory, National Institute of Standards and Technology, May 2009.



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AWM-SIAM Sonia Kovalevsky Lecturer, July 2008.  
Keynote address, SIAM Conference on Data Mining, April 2008.  
Board of Visitors Distinguished Faculty Award, College of Computer, Mathematical, and Physical Sciences, University of Maryland, 2007.  
Named an ACM Fellow, November 2006.  
Named an ACM Distinguished Scientist, October 2006.  
Doctor of Mathematics, *honoris causa*, from the University of Waterloo for “outstanding contributions to research and education in the mathematical and computer sciences and leadership and promotion of women in the field,” October 2005.  
Best Paper Award, 19th Annual Symposium on Automation and Robotics in Construction (ISARC 2002), for “Reconstructing Images of Bar Codes for Construction Site Object Recognition,” with D. Gilsinn and G. Cheok, NIST, Gaithersburg, MD, September 2002.  
St. George Emblem, Washington D.C. Catholic Committee on Boy Scouting, 2001.  
P.A.D.I Certified Open-water SCUBA Diver, 1997; Advanced Open-water Diver 1998.  
Outstanding Poster Award for “Overview of the Semi-Discrete Matrix Decomposition and Its Applications,” (with Tamara G. Kolda), Sixth SIAM Conference on Applied Linear Algebra, Snowbird, Utah, October 1997.  
Semester Research Award, General Research Board, Office of Graduate Studies and Research, 1992, 1997.  
Second Place Award for the poster presentation “Regularization by Truncated Total Least Squares,” (with R. Fierro, G.H. Golub, and P.C. Hansen), Fifth SIAM Conference on Applied Linear Algebra, Snowbird, Utah, June 1994.  
Distinguished Alumna Award, Purdue University 1993.  
Hertz Foundation Fellow 1972-1975.  
Betty Crocker Homemaker of Tomorrow for the State of Illinois 1969.

### **Editorships and Reviewing Activities for Journals**

Editor-in-Chief, *SIAM Journal on Matrix Analysis and Applications* 2009-2015  
Member, Editorial Board, *SIAM Review* Education Section 2007-2014  
Member, Editorial Board, SIAM Books 2009-2014  
Department Editor, “Your Homework Assignment,” a column in *Computing in Science and Engineering*, <http://www.computer.org/cise/homework/> 2002-2006, 2011-  
Member, Editorial Board, *Computing in Science and Engineering*, formerly *IEEE Computational Science and Engineering* 1994-  
Member, Editorial Board, *SIAM Journal on Matrix Analysis and Applications* 1995-2003, 2006-2009  
Member, Editorial Board, SIAM book series on “Fundamentals of Algorithms” 2003-2010  
Associate Editor, *Linear Algebra and Its Applications* 1998-2003  
Member, Editorial Board, *SIAM Review* 1989-1997  
Editor, *Linear Algebra and Its Applications* issue on papers presented at the ILAS Conference, Winnipeg, Canada, June 1997.  
Editor, *Linear Algebra and Its Applications* issue on papers presented at the Third ILAS Conference, Pensacola, FL March 1993.  
Member, Editorial Board, *SIAM Journal on Scientific and Statistical Computing* 1981-1989

### **Memberships in Professional Societies**

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Society for Industrial and Applied Mathematics  
Association for Computing Machinery  
American Association for the Advancement of Science  
Association for Women in Mathematics  
Phi Beta Kappa

### III. Teaching and Advising

#### 1. *Courses Taught Recently*

|                         |                                                       |                                                 |                                     |
|-------------------------|-------------------------------------------------------|-------------------------------------------------|-------------------------------------|
| CMSC 460/<br>AMSC 460   | Computational Methods                                 | (30 students)                                   | Fall 2007                           |
| CMSC 498D/<br>AMSC 498D | Image Deblurring                                      | (30 students)                                   | Spring 2012                         |
| CMSC 660/<br>AMSC 660   | Scientific Computing I                                | (30 students)<br>(30 students)<br>(30 students) | Fall 2010<br>Fall 2009<br>Fall 2008 |
| CMSC 661/<br>AMSC 661   | Scientific Computing II                               | (20 students)                                   | Spring 2010                         |
| CMSC 662/<br>AMSC 662   | Computer Organ. and Prog.<br>for Scientific Computing | (25 students)<br>(35 students)                  | Fall 2011<br>Fall 2013              |
| CMSC 760/<br>AMSC 600   | Advanced Linear<br>Numerical Analysis                 | (25 students)                                   | Fall 2007                           |
| CMSC 764/<br>AMSC 607   | Advanced Optimization                                 | (20 students)<br>(25 students)                  | Fall 2010<br>Fall 2008              |

#### 2. *Other Courses*

- CMSC 150: Discrete Mathematics
- CMSC 251: Algorithms
- CMSC 311: Computer Organization
- CMSC 411: Computer Systems Architecture
- CMSC 452: Theory of Computation
- CMSC/MAPL 466: Introduction to Numerical Analysis I
- CMSC/MAPL 666: Numerical Analysis I
- (ETH) Parallel Numerical Computing

#### 3. *Advising: Other than Research Direction*

#### 4. *Advising: Research Direction*

##### *Ph.D. Students*

- (a) Mansuk Song, “Regularization - Projection Methods and Finite Element Approximations for Ill-Posed Linear Operator Equations,” University of Michigan, 1978. (Directed jointly with M. Z. Nashed).

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- (b) David C. Fisher, "Matrix Computation on Processors in One, Two, and Three Dimensions," Applied Mathematics Program, University of Maryland, 1985.
  - (c) John Conroy, "Parallel Direct Solution of Sparse Linear Systems of Equations," Applied Mathematics Program, University of Maryland, 1986.
  - (d) Pil Seong Park, "Iterative Solution of Sparse Linear Systems Arising from Queueing Networks," Applied Mathematics Program, University of Maryland, 1991.
  - (e) Chiou-Ming Huang, "Multi-Splitting Preconditioners for the Conjugate Gradient Algorithm," Computer Science Department, University of Maryland, 1992.
  - (f) Peter Whitman, "Solution Ranges in Stochastic Linear Programming," Applied Mathematics Program, University of Maryland, 1993.
  - (g) Yuan-Jye Jason Wu, "Matrix Decompositions for Markov Chains and Signal Processing," Applied Mathematics Program, University of Maryland, 1995.
  - (h) Weichung Wang, "Iterative Methods in Interior Point Methods for Linear Programming," Applied Mathematics Program, University of Maryland, 1996.
  - (i) Tamara Gibson Kolda, "Limited-Memory Matrix Methods with Applications," Applied Mathematics Program, University of Maryland, 1997.
  - (j) Misha E. Kilmer, "Regularization of Ill-Posed Problems," Applied Mathematics Program, University of Maryland, 1997 (directed jointly with G. W. Stewart).
  - (k) Ilya A. Zavorin, "Analysis of GMRES Convergence by Spectral Factorization of the Krylov Matrix," Applied Mathematics and Scientific Computing Program, University of Maryland, 2001 (directed jointly with Howard Elman).
  - (l) Bitu Khoshvaghti, "Prediction of Protein Folding Using Residue Fragment Graphs," Applied Mathematics and Scientific Computing Program, University of Maryland, 2003.
  - (m) Daniel M. Dunlavy, "Homotopy Optimization Methods and Protein Structure Prediction," Applied Mathematics and Scientific Computing Program, University of Maryland, 2005.
  - (n) Haw-ren Fang, "Matrix Factorizations, Triadic Matrices, and Modified Cholesky Factorizations for Optimization," Computer Science Department, University of Maryland, 2006.
  - (o) Simon P. Schurr, "An Inexact Interior-Point Algorithm for Conic Convex Optimization Problems," Applied Mathematics and Scientific Computing Program, University of Maryland, 2006 (directed jointly with Andre Tits).
  - (p) Elena Zotenko, "Computational Methods in Protein Structure Comparison and Analysis of Protein Interaction Networks," Computer Science Department, University of Maryland, 2007 (directed jointly with Teresa Przytycka).
  - (q) Jin Hyuk Jung, "Adaptive Constraint Reduction for Convex Quadratic Programming and Training Support Vector Machines," Computer Science Department, University of Maryland, 2008.
  - (r) Michael J. O'Hara "Adiabatic Quantum Computation: Noise in the Adiabatic Theorem and Using the Jordan-Wigner Transform to Find Effective Hamiltonians," Applied Mathematics and Scientific Computing Program, University of Maryland, 2008.
  - (s) Stacey O. Nicholls, "Column Generation in Predictor-Corrector Methods for Solving Linear Programs," Applied Mathematics and Scientific Computing Program, University of Maryland, 2009.
  - (t) Konstantin Berlin, "Protein-Protein Docking Using Long Range Nuclear Magnetic Resonance Constraints," Computer Science Department, University of Maryland, 2010 (directed jointly with David Fushman).

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- (u) Sungwoo Park, “Matrix Reduction in Numerical Optimization,” Computer Science Department, University of Maryland, 2011.
  - (v) David A. Schug, “Three Dimensional Edge Detection Using Wavelet and Shearlet Analysis,” Applied Mathematics & Statistics and Scientific Computing Program, University of Maryland, 2012 (directed jointly with Glenn R. Easley).
  - (w) Brianna R. Cash, “Using Domain-Specific Information in Image Processing,” Applied Mathematics & Statistics and Scientific Computing Program, University of Maryland, 2014.
  - (x) Viktoria Taroudaki, “Image Estimation and Uncertainty Quantification,” Applied Mathematics & Statistics and Scientific Computing Program, University of Maryland, 2015.
  - (y) Roozbeh Yousefzadeh, “Interpreting Machine Learning Models and Application of Homotopy Methods, Computer Science Department, University of Maryland, 2019.

*M.A. Students*

- (a) Robert E. Blase, “Parametric eigensystem computation techniques,” M.A. Thesis, Applied Mathematics Program, University of Maryland, 1982.
- (b) Bruce G. White, “Graphical Debugging Tools for Parallel Algorithms,” M.A. Thesis, Computer Science Department, University of Maryland, 1987.
- (c) Tongbiao Li, “The  $s$ -Step Block Minimal Residual Method,” M.A. scholarly paper, Applied Mathematics Program, University of Maryland, 1994.
- (d) Tamara L. Gibson, “NAS Parallel Conjugate Gradient Benchmark on the Cray T3D,” M.A. scholarly paper, Applied Mathematics Program, University of Maryland, 1995.
- (e) Allen Gregory Harbaugh, “Minimization Techniques for Eigenvalue and Eigenvector Problems,” M.A. scholarly paper, Applied Mathematics Program, University of Maryland, 1998.
- (f) Kimberly Ann Flagg Sellers, “Iterative Methods for Computing Mean First Passage Times of Markov Chains,” M.A. Thesis, Mathematics Department, University of Maryland, 1998.
- (g) Armin A. Pruessner, “Blind Deconvolution Using a Regularized Structured Total Least Norm Algorithm,” M.A. Thesis, Applied Mathematics Program, University of Maryland, 2001.
- (h) Anoop Kalsi, “Blind Two-Dimensional Deconvolution Using Total Least Squares,” M.A. Thesis, Mathematics Department, University of Maryland, 2002.
- (i) Che-Rung (Roger) Lee, “Yield Optimizatoin of VLSI Layout Using a Dynamic L-infinity Voronoi Diagram,” M.A. scholarly paper, Computer Science Department, University of Maryland, 2002.
- (j) Sarah A. Brown, “Incorporating a Model in Asynchronous Parallel Pattern Search,” M.A. scholarly paper, Mathematics Department, University of Maryland, 2003.
- (k) Daniel Dunlavy, “QCS: A Method for Querying, Clustering, and Summarizing Documents”, M.A. scholarly paper, Applied Mathematics and Scientific Computing Program, University of Maryland, 2003.
- (l) Stacey O. Nicholls, “A Column Generation Approach to Solving Large-Scale Integer and Linear Programming Problems,” M.A. scholarly paper, Applied Mathematics and Scientific Computing Program, University of Maryland, 2004.
- (m) Elena Zotenko, “Geometric Invariants for Protein Structure Comparison,” M.A. scholarly paper, Computer Science Department, University of Maryland, 2004.
- (n) Simon P. Schurr, “Properties of Central Paths in Linear and Nonlinear Programming,” M.S. scholarly paper, Applied Mathematics Program, University of Maryland, 2005.
- (o) Ping Chen, “The Adaptive Preconditioned Conjugate Gradient Method,” M.S. scholarly paper, Computer Science Department, University of Maryland, 2005.

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- (p) Jin-Hyuk Jung, “Cholesky Decomposition and Linear Programming on a GPU,” M.S. scholarly paper, Computer Science Department, University of Maryland, 2006.
  - (q) Brianne L. Roth, “An Alternative Method for Computing the Semidiscrete Matrix Decomposition,” M.S. scholarly paper, Computer Science Department, University of Maryland, 2006.
  - (r) Michael J. O’Hara, “Research Topics in Adiabatic Quantum Computing,” M.A. scholarly paper, Applied Mathematics Program, University of Maryland, 2006.
  - (s) Jhacova A. Williams, “The Use of Preconditioning for Training Support Vector Machines,” M.S. thesis, Applied Mathematics Program, University of Maryland, 2008.
  - (t) Sungwoo Park, M.A. scholarly paper, Computer Science Department, University of Maryland, 2009.
  - (u) Kathryn Linehan, “Information Retrieval through Various Approximate Matrix Decompositions,” M.A. scholarly paper, Applied Mathematics Program, University of Maryland, 2009.
  - (v) Brianna Satinoff, “An Evaluation of Two Algorithms for Hierarchically Semiseparable Matrices,” M.S. Scholarly Paper, Computer Science Department, University of Maryland, 2011.
  - (w) Viktoria Taroudaki, “Image Deblurring – Computation of Confidence Intervals,” M.S. Scholarly paper, Applied Mathematics, Statistics, and Scientific Computing Program, University of Maryland, 2011.
  - (x) Brianna Cash, “Automated Parameter Selection Tool for Solution to Ill-Posed Problems,” M.S. Scholarly paper, Applied Mathematics, Statistics, and Scientific Computing Program, University of Maryland, 2012. (Graduate School lost the paperwork, so degree is dated 2013).
  - (y) Roozbeh Yousefdeh, “A Homotopy Method for Optimizing Real-time Dispatching Decisions in Freight Systems,” M.A. scholarly paper, Computer Science Department, University of Maryland, 2018.

*B.A. Students*

- (a) Nilani Aluthgedara, “Recognizing Sentence Boundaries and Boilerplate,” Honors thesis, Computer Science Department, University of Maryland, 2003.

*High School Students*

- (a) Urja Mittal, “Evaluating and Improving the Efficiency of Mangasarian’s Linear Programming Algorithm,” winner of Galileo Circle Award, Washington Academy of Science and Blair High School’s Vaccaro Award.

IV. *Service*

1. *Professional*

Member of AMS-MAA-SIAM Joint Committee on the Porter Public Lecture, 2016-

Reviewer for NCWIT Award for Aspirations in Computing, 2014-

Speaker at the CRA-W Early and Mid Career Mentoring Workshops, November 2016.

Member of Program Committee, NAACL-HLT 2012 Workshop on Evaluation Metrics and System Comparison for Automatic Summarization June 8, 2012 Montreal, Quebec, Canada

Member of Oversight Committee, Gene Golub SIAM Summer Schools, 2010-2014.

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Member of Organizing Committee, SIAM Conference on Applied Linear Algebra (LA12), Valencia, Spain, June 18-22, 2012.

Member of Advisory Committee, SIAM Linear Algebra Activity Group International Summer School on Numerical Linear Algebra, 2007-2012.

Member of Organizing Committee, Numerical Linear Algebra: Perturbation, Performance, and Portability, Conference in honor of G. W. Stewart, Austin, Texas, 2010.

Member of Organizing Committee, 2010 SIAM Annual Meeting.

Chair of AWM Committee on Committees, 2009-2011.

Member of Review Committee, Applied Science, College of William and Mary, 2009.

Member of External Advisory Board, Computer Science Department, George Washington University, 2005-2007

Mentor in AWM Mentor Network, 2001-

Member of SIAM/AMS/ASA/AWM/IMS/MAA/NCTM Joint Committee on Women 2004-2007

Member of the Organizing Committee, Householder Conferences (formerly the Gatlinburg series of conferences), 1987-2005

Member of the Organizing Committee, SIAM 2004 Annual Meeting

Co-organizer (with Tamara Kolda) of “Women of Applied Mathematics: Research and Leadership” Meeting, October 2003.

Member of the Board on Mathematical Sciences of the National Research Council, 1996-2001

Chair of the Organizing Committee, “Research, Careers, and Computer Science: A Maryland Symposium,” 2001.

Member of the Organizing Committee, Workshop on the Interface between Computer Science and Mathematics, sponsored by the National Research Council, 2000, and moderator for the Data Mining and Search session.

Member of Organizing Committee and Co-Chair of Program Committee, Olga Taussky Todd Celebration, MSRI, Berkeley, July 1999.

Member of review committee, Computer Science Department, Purdue University, 1999.

Member of Committee of Visitors for the Division of Mathematical Sciences, National Science Foundation, 1995, 1998.

Member of NSF Panel on Postdoctoral Programs in Computational Science and Engineering, New Technologies Program, Division of Advanced Scientific Computing, 1994.

Member of SIAM Nominating Committee, 1994-96

Mentor for participants in the AWM Workshop for Graduate Students and Post-Docs, SIAM Meeting, Stanford, CA, July 1997.

Organizer (with George Cybenko and Jorma Rissanen) of the IMA Workshop on The Mathematics of Information Coding, Extraction, and Distribution, November 11-15, 1996, Minneapolis, MN.

Founder and moderator of AWM-Net, an electronic mailing list, 1994-2005.

Organizer of the AWM Workshop for Graduate Students and Post-Docs, SIAM Meeting, San Diego, CA, July 1994.

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Co-chair (with Bob Plemmons) of Program Committee and member of the Organizing Committee for the Workshop on Linear Algebra in Control Theory, Signal Processing and Image Processing, Winnipeg, Canada, June 6-8, 1997.

Member of Organizing Committee, University of Minnesota IMA Special Year on the Mathematics of High Performance Computing, 1996-97.

Member of the AMS-SIAM Committee on Applied Mathematics, 1994-97.

Chair of Program Committee, Householder Conference, 1993-96.

Member of Review Committee, Mathematics and Computer Science Division, Argonne National Laboratory, 1989-1994. Chair of Committee, 1991-94.

Member of Awards Committee, SIAM Student Paper Competition, 1993.

Member, SIAM Council, 1989-1991

Representative of SIAM Council to SIAM Board of Trustees, 1990-91

Member, Board of Directors, ACM Special Interest Group on Numerical Mathematics, 1985-1988

Member of the Evaluation Panel for NSF Postdoctoral Fellowships in the Mathematical Sciences, 1985-1988

Member of the Executive Committee of the Evaluation Panel for NSF Postdoctoral Fellowships in the Mathematical Sciences, and Chairperson of the Evaluation Panel, 1987-1988

Organizer of Workshop on Scientific Computing Using Parallel Architectures, (Greenbelt, Maryland), sponsored by University of Maryland Institute for Advanced Computer Studies and Computer Science Department, and the Air Force Office of Scientific Research, April, 1987

SIAM Representative to Joint Committee on Women in the Mathematical Sciences, 1984-1986

Member of NSF Selection Panel for Equipment Grants for the Mathematical Sciences, 1985

Referee for National Science Foundation, Department of Energy

## 2. *University*

Computer Science Department:

Member of CS/UMIACS Diversity and Inclusion Committee, 2016-

Member of Teaching Evaluation Committee, 2012-2014.

Member of Departmental Council, 1987-1991, 1993-1994, 2000-2001, 2007-2009, 2011-2012, 2013-2014.

Member of Search Committee for Computer Science Department Chairperson, 1978-1979, 1981-1982, 1987-1988, 2011-2012.

Member of Education Committee, 1978-2014

Member of Numerical Analysis Field Committee, 1978-2014

Chair, Faculty Search Committee, 2009-2010. Member, Faculty Search Committee, 2010-2011, 2011-2012.

Chair, Academic Integrity Committee, 1999-2005, 2007-2008.

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Chairperson of Review Committee for Departmental Plan of Organization, 1979-1980, 1999-2000, 2006-2007.

Co-Chair of Recruiting and Retention of Women and Minorities Committee, Departmental Retreat, 2003-2004.

Chair, Faculty Awards Committee, 2004-2005.

Chairperson of the Appointments, Promotion, and Tenure (APT) Committee, 1990-1991, 2001-2002, 2002-2003, 2008-2010.

Chair, Organizing Committee: Research, Careers, and Computer Science: A Maryland Symposium, Fall 2001.

Member of Merit Pay Committee, 1996-1997.

Member of Academic Evaluation Committee, 1995-1997.

Director of Undergraduate Studies, 1989-1991.

Associate Chairperson for Research and Administration, 1987-1988.

Member of Laboratory Committee, 1992-1993, 1994-1998, 1999-2000.

Member of Program Library Policy Committee, 1988-1989.

Chairperson of Committee to Review CMSC 112/113, 1988-1989.

EEEE Officer 1980-1982, 1987-1988.

Member of Internal Review Committee for Computer Science Department, 1985-1986.

Chairperson of Recruiting Committee for Computer Science Department Faculty, 1983-1984.

Graduate Admissions and Financial Aid Committee, 1982-1983.

#### Applied Mathematics Program:

Elected to Graduate Committee for Applied Mathematics, 1981-1983, 1985-1987, 1999-2002, 2006-2012.

Member of Admissions Committee, 2006-2012.

Member of Applied Mathematics Faculty, 1979-2014.

Elected to Committee on the Applied Mathematics Faculty, 1988-1990.

#### Institute for Advanced Computer Studies:

Founding Co-Director, Center for Quantum Information and Computer Science (QuICS), 2013-2015, joint with NIST.

Chair of the APT Committee, 2011-2012.

Member of APT Committee, 1990-1991, 1993-1995, 1997-1998, 2001-2002, 2003-2005, 2007-2014.

Co-chair, Search Committee for Bioinformatics faculty, 2001-2003.

Elected member of Steering Committee, 1994-1995, 2011-2012.

#### College:

Served on Search Committee for Chair of Mathematics Department, 2006-2007.

Served on CMPS Women in Technology Panel, March 2004.

Member of CMPS APT Committee, 2002-2004.

Member of Search Committee for UMIACS Director, 2002-2003.



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Member of Committee to Design Computational Science Curriculum, 2000.  
Member of Search Committee for Director of the Center for Scientific Computation, 2000.  
Member of Computational Science Committee 1996-1997.  
Member of Future Directions for MAPL Committee 1994.  
Chairperson, Internal Review Committee for the Mathematics Department 1993.  
Member of CMPS Education Committee 1989-1991.  
Member of CMPS PCC Committee 1989-1990.  
Chairperson, CMPS Salary Review Committee, 1987, 1989.

Campus:

Judge for Graduate Research Appreciation Day, 2017.  
Member of Campus Courses, Curriculum, and Program Committee, 1986-1987.

3. Community:

Girl Scout Troop 2036 Leader 1993-1998  
Boy Scout Explorer Post 769 Advisor 1996-1998  
Cub Scout Pack 1072 Committee Chair 1993-1997  
Boy Scout Troop 772 Committee Member 1995-2004, and Treasurer 1995-1999  
Religious Education Teacher, 1st grade, 2014-2015.  
Adult Education Tutor, 2015-  
Work with the homeless 2015-