

Curriculum Vitae: June 25, 2021

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Date of Birth: March 1, 1958

Birthplace: Boston, Massachusetts, USA

Citizenship: USA

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Work Experience

Rutgers Business School, Rutgers University, Piscataway NJ

1995-present: Department of Management Science and Information Systems (MSIS).

- Full Professor July 2004-present
- Associate Professor with tenure: July 1998-June 2004
- Assistant Professor: July 1995-June 1998
- Vice chair of department July 2008-June 2011
- Course coordinator for *Operations Management* 1997-2013, and *Management Information Systems* 2005-2013.
- Coordinator for newly developed undergraduate major in Business Analytics and Information Technology (BAIT), January 2010-present.
- Member of the following research centers:
 - RUTCOR (1995-present)
 - DIMACS (1995-present)
 - CCICADA (2013-present)

Teach undergraduate, masters, and doctoral courses and pursue research in mathematical optimization, operations research, business analytics, parallel algorithms, and information systems. Notes: school was formerly called “Faculty of Management,” and, prior to merger, “School of Business New Brunswick”; spent 2000-2001 and 2007-2008 academic years on sabbatical at ORFE department, Princeton University. Spent the 2014-2015 academic year on sabbatical with visiting positions at IEOR department, Columbia University, and ORFE department, Princeton University.

Thinking Machines Corporation, Cambridge MA

Scientist, July 1991-May 1995. Performed applied and theoretical research on parallel optimization algorithms, along with some consulting and sales support duties. Member of

Mathematical Sciences Research Group until its dissolution in October 1994. Various consulting assignments 1995-1996.

Harvard University, Graduate School of Business, Boston MA

Assistant professor, July 1989-June 1991. Taught at the MBA level and pursued research interests in mathematical programming and parallel computation.

Massachusetts Institute of Technology, Cambridge MA

Research assistant, February 1984-September 1986. Developed optimization codes for network flow, integer programming decomposition, and Lagrangian branch-and-bound. Oversaw installation of Apollo and Macintosh computer networks. Purchased hardware and software, augmented system software, wrote a user manual, and created color graphics demonstration programs. Coordinated visiting faculty seminar series.

Massachusetts Institute of Technology, Cambridge MA

Part-time teaching assistant for *Operations Management* course, September 1984-December 1984.

Xenergy Incorporated, Burlington MA

Programmer/analyst, September 1980-August 1982, July 1983-January 1984. Designed, implemented, and maintained a variety of software, including some very large packages. Formulated probabilistic models of energy use in buildings, and applied nonlinear optimization techniques to them. Worked on sample design for electric utility customer surveys. Supervised other computer programmers. Performed “energy audits” of commercial buildings. Occasionally acted as a mathematical and computational consultant 1984-1990.

Stanford University, Stanford CA

Full-time teaching assistant for engineering mathematics, September 1982-June 1983. Taught graduate students topics including computational linear algebra and both numerical and analytic methods for differential equations.

System Dynamics Incorporated, Morristown NJ

Microcomputer consultant and programmer, June 1978-August 1978, June 1979-August 1979. Analyzed microcomputer applications. Wrote firmware for point-of-sale terminal.

Applied Data Research Incorporated, Princeton, NJ

Programmer, June 1976-September 1976, June 1977-September 1977. Wrote assembly-language microprocessor firmware for telephone equipment. Wrote mainframe COBOL programs to process telephone billing data.

Princeton University, Princeton NJ

Research assistant/programmer, June 1975-July 1975. Helped analyze data on heat loss from residences.

Grants

NSF grant CCR-9902092, “Adaptable and Scalable Techniques for Branching Algorithms,” Numeric, Symbolic, and Geometric Computation Program, Computer-Communication Research, CISE directorate, August 1999-July 2004, \$239,967.

NSF grant CCF-1115638, “AF: Small: Approximate Augmented Lagrangians: First-Order and Parallel Optimization Methods, with Applications to Stochastic Programming,” Computing and Communications Foundations, CISE directorate, July 2011-July 2015, \$358,499.

AFOSR grant FA9550-11-1-0164, “Coherent Risk-Adjusted Decisions Over Time: A Bilevel Programming Approach,” Optimization and Discrete Mathematics Program, Mathematics, Information and Life Sciences Directorate, July 2011-January 2015, \$452,617 (Andrzej Ruszczyński, co-PI).

XSEDE grant DDM150001, “Parallel Approximate Augmented Lagrangian Optimization Methods, with Stochastic Programming Applications.” 250,000 core-hours of computing resources, equivalent value \$16,780, April 2015-March 2015. XSEDE stands for “Extreme Science and Engineering Discovery Environment”, and is funded by NSF grant ACI-1053575.

AFOSR grant FA95550-15-1-0251, “Coherent Risk-Adjusted Decisions Over Time: A Bilevel Programming Approach (Renewal),” Optimization and Discrete Mathematics Program, July 2015-July 2019, \$482,042 (Andrzej Ruszczyński, co-PI).

NSF grant award CCF-1617617 “AF: Small: Incremental and Asynchronous Projective Splitting Methods for Mathematical Programming,” Computing and Communications Foundations, CISE directorate, September 2016-August 2020, \$457,072.

Sandia National Laboratories research contract 742674, “Parallel Augmented Lagrangian Solution of Stochastic Optimization Problems,” October 2016-June 2017, \$56,057.

Awards/Honors/Fellowships

Dean’s Research Professor award, Rutgers Business School, July 2019-June 2022. \$20,000 per year award for three years, in recognition of research excellence.

“My Mark” award from the 2016 Mark Leadership Conference sponsored by Rutgers University Division of Student Affairs, Leadership and Experiential Learning group, given in recognition of my leading role in creating the BAIT (Business Analytics and Information Technology) undergraduate major. These university-wide awards are given to one student organization, one faculty or staff member, and one student per year.

Elected fellow of INFORMS (Institute for Operations Research and Management Science), Fall 2014.

Dean’s summer award for research excellence, Rutgers Business School Newark and New Brunswick, summer 2014, \$10,000.

Voted best professor in BAIT (Business Analytics and Information Technology) major, spring 2014, by Rutgers Business Governing Association, student governing association of Rutgers undergraduate business program, New Brunswick campus.

Honorary membership in Alpha Kappa Psi business fraternity, conferred April 2007, in recognition of teaching.

2006 COIN-OR Cup (from the COIN-OR foundation for open-source operations research software) for valuable contributions to open-source software for operations research, awarded jointly with Cynthia A. Phillips and William E. Hart of Sandia National Laboratories.

2003 Thomas H. Mott, Jr. award for excellence in teaching, awarded by popular vote of graduating senior business majors, Rutgers University, New Brunswick.

Rutgers University Board of Trustees Research Fellowship for Scholarly Excellence, awarded May 1998.

1996-1997 Lilly Endowment Teaching Fellow.

Fellowship from the MIT/Harvard/Brown Center for Intelligent Control 1988-1989.

Phi Beta Kappa, inducted June 1980.

Magna cum laude graduation honors, Harvard College, 1980.

Education

Massachusetts Institute of Technology, Cambridge MA

Ph.D. in operations research, June 1989. Thesis title: *Splitting Methods for Monotone Operators with Applications to Parallel Optimization*. Advisor: Dimitri P. Bertsekas. Specialization/minor in computer science.

S.M. in operations research, June 1986. Thesis title: *Routing Methods for Twin-Trailer Trucks*. Advisor: Yossi Sheffi.

Stanford University, Stanford CA

Completed first academic year of two-year master's program in mechanical engineering, 1982-1983. Courses included thermodynamics, fluid mechanics, solar engineering, and operations research.

Harvard University, Cambridge MA

A.B. in mathematics, *magna cum laude*, June 1980. Phi Beta Kappa. Additional courses in physics, computer science, economics, urban planning, and various areas of art and history. Thesis title: *The Algebra of [Error-Correcting] Codes: An Introduction*. Advisor: Andrew Gleason.

Publications

Refereed Journals

- [1] Patrick R. Johnstone and Jonathan Eckstein. "Single-Forward-Step Projective Splitting: Exploiting Cocoercivity," *Computational Optimization and Applications* 78(1):125-166 (2021).
- [2] Patrick R. Johnstone and Jonathan Eckstein. "Projective Splitting with Forward Steps," *Mathematical Programming*, published online September 2020.

- [3] Jonathan Eckstein. “Deriving Solution Value Bounds from the ADMM,” *Optimization Letters* 14(6) 1289-1303 (2020).
- [4] M. Marques Alves, Jonathan Eckstein, Marina Geremia, and Jefferson G. Melo. “Relative-error inertial-relaxed versions of Douglas-Rachford and ADMM splitting algorithms,” *Computational Optimization and Applications* 75(2):389–422 (2020).
- [5] Patrick R. Johnstone and Jonathan Eckstein, “Projective Splitting with Forward Steps Only Requires Continuity,” *Optimization Letters* 14(1):229-247 (2020).
- [6] Patrick R. Johnstone and Jonathan Eckstein, “Convergence Rates for Projective Splitting,” *SIAM Journal on Optimization* 29(3):1931-1957 (2019).
- [7] Jonathan Eckstein, Ai Kagawa, and Noam Goldberg. “REPR: Rule-Enhanced Penalized Regression,” *INFORMS Journal on Optimization* 1(2):143-163 (2019).
- [8] Jonathan Eckstein and Wang Yao. “Relative-error approximate versions of Douglas-Rachford splitting and special cases of the ADMM,” *Mathematical Programming* 170(2):417-444 (2018).
- [9] Patrick L. Combettes and Jonathan Eckstein. “Asynchronous Block-Iterative Primal-Dual Decomposition Methods for Monotone Inclusions,” *Mathematical Programming* 168(1-2):645-672 (2018).
- [10] Jonathan Eckstein and Wang Yao. “Approximate ADMM Algorithms Derived from Lagrangian Splitting,” *Computational Optimization and Applications* 68(2):363-405 (2017).
- [11] Jonathan Eckstein. “A Simplified Form of Block-Iterative Operator Splitting and an Asynchronous Algorithm Resembling the Multi-Block Alternating Direction Method of Multipliers,” *Journal of Optimization Theory and Applications* 173(1):155-182 (2017).
- Note: corrected proof of one proposition in “Comments on A Simplified Form of Block-Iterative Operator Splitting and an Asynchronous Algorithm Resembling the Multi-Block Alternating Direction Method of Multipliers,” *Journal of Optimization Theory and Applications*, available online February 2018.
- [12] Jonathan Eckstein, Deniz Eskandani, and Jingnan Fan. “Multilevel Optimization Modeling for Risk-Averse Stochastic Programming,” *INFORMS Journal on Computing* 28(1):112-128 (2016). Includes two associated online supplements, one containing all the mathematical proofs and the second containing revised numerical results.
- [13] Jonathan Eckstein and Wang Yao. “Understanding the Convergence of the Alternating Direction Method of Multipliers: Theoretical and Computational Perspectives,” *Pacific Journal of Optimization* 11(4):619-644 (2015).
- [14] Jonathan Eckstein, William E. Hart, and Cynthia A. Phillips. “PEBBL: An Object-Oriented Framework for Scalable Parallel Branch and Bound,” *Mathematical Programming Computation*, 7(4):429-469 (2015).

- [15] Jonathan Eckstein and Paulo J.S. Silva. “A Practical Relative Error Criterion for Augmented Lagrangians,” *Mathematical Programming* 141(1-2):319-348 (2013).
- [16] Jonathan Eckstein and Noam Goldberg. “An Improved Branch-and-Bound Method for Maximum Monomial Agreement.” *INFORMS Journal on Computing* 24(2):328-341 (2012).
- [17] Noam Goldberg and Jonathan Eckstein. “Sparse Weighted Voting Classifier Selection and its Linear Programming Relaxations,” *Information Processing Letters* 112:481-486 (2012).
- [18] Stephen Boyd, Neil Parikh, Eric Chu, Borja Peleato, and Jonathan Eckstein. “Distributed Optimization and Statistical Learning via the Alternating Direction Method of Multipliers”, *Foundations and Trends in Machine Learning* 3(1):1-122 (2011).
- [19] Jonathan Eckstein and Paulo J.S. Silva. “Proximal Methods for Nonlinear Programming: Double Regularization and Inexact Subproblems.” *Computational Optimization and Applications* 46(2):279-304 (2010).
- [20] Jonathan Eckstein and Benar F. Svaiter. “General Projective Splitting Methods for Sums of Maximal Monotone Operators,” *SIAM Journal on Control and Optimization* 48(2):787-811 (2009).
- [21] Jonathan Eckstein, Avigdor Gal, and Sarit Reiner. “Optimal Information Monitoring under a Politeness Constraint,” *INFORMS Journal on Computing* 20(1):3-20 (2008).
- [22] Farid Alizadeh, Jonathan Eckstein, Nilay Noyan, and Gábor Rudolf. “Arrival Rate Approximation by Nonnegative Cubic Splines,” *Operations Research* 56(1):140-156 (2008).
- [23] Jonathan Eckstein and Benar F. Svaiter. “A Family of Projective Splitting Methods for the Sum of Two Maximal Monotone Operators,” *Mathematical Programming* 111(1-2):173-199 (2008).
- [24] Jonathan Eckstein and Mikhail Nediak. “Pivot, Cut, and Dive: A Heuristic for Mixed 0-1 Integer Programming,” *Journal of Heuristics* 13(5):471-503 (2007).
- [25] Paulo J.S. Silva and Jonathan Eckstein. “Double-Regularization Proximal Methods, with Complementarity Applications,” *Computational Optimization and Applications* 33(2-3):115-156 (2006).
- [26] Jonathan Eckstein and Mikhail Nediak. “Depth-Optimized Convexity Cuts,” *Annals of Operations Research* 139: 95-129 (2005).
- [27] Avigdor Gal, Jonathan Eckstein, and Zachary Stoumbos. “Scheduling of Data Transcription in Periodically Connected Databases,” *Stochastic Analysis and Applications* 21(5):1021-1058 (2003).
- [28] Jonathan Eckstein. “A Practical General Approximation Criterion for Methods of Multipliers Based on Bregman Distances,” *Mathematical Programming* 96(1):61-86 (2003).

- [29] Jonathan Eckstein, Peter L. Hammer, Ying Liu, Mikhail Nediak, and Bruno Simeone. "The Maximum Box Problem and its Application to Data Analysis," *Computational Optimization and Applications* 23(3):285-298 (2002).
- [30] Jonathan Eckstein and Steven T. Riedmueller. "YASAI: Yet Another Add-In for Teaching Elementary Monte Carlo Simulation in EXCEL," *INFORMS Transactions on Education* 2(2) (2002), <http://ite.pubs.informs.org/Vol2No2/EcksteinRiedmueller/>.
- [31] Avigdor Gal and Jonathan Eckstein. "Managing Periodically Updated Data in Relational Databases: A Stochastic Modeling Approach," *Journal of the ACM* 46(6):1141-1183 (2001).
- [32] Paulo J. S. Silva, Jonathan Eckstein, and Carlos Humes, Jr. "Rescaling and Stepsize Selection in Proximal Methods using Separable Generalized Distances," *SIAM Journal on Optimization* 12(1):238-261 (2001).
- [33] Jonathan Eckstein and Michael C. Ferris. "Smooth Methods of Multipliers for Complementarity Problems," *Mathematical Programming* 86(1):65-90 (1999).
- [34] Jonathan Eckstein and Michael C. Ferris. "Operator Splitting Methods for Monotone Affine Variational Inequalities, with a Parallel Application to Optimal Control," *INFORMS Journal on Computing* 10(2):218-235 (1998).
- [35] Jonathan Eckstein and Michael C. Ferris. "Operator Splitting Methods for Monotone Affine Variational Inequalities, with a Parallel Application to Optimal Control," *INFORMS Journal on Computing* 10(2):218-235 (1998).
- [36] Jonathan Eckstein. "How Much Communication Does Parallel Branch and Bound Need?" *INFORMS Journal on Computing* 9(1):15-29 (1997).
- [37] Jonathan Eckstein. "Distributed versus Centralized Storage and Control for Parallel Branch and Bound: Mixed Integer Programming on the CM-5," *Computational Optimization and Applications*, 7(2):199-220 (1997).
- [38] Jonathan Eckstein, Ilkay Boduroglu, Lazaros Polymenakos, and Donald Goldfarb. "Data-Parallel Implementations of Dense Simplex Methods on the Connection Machine CM-2," *ORSA Journal on Computing* 7(4):402-416 (1995).
- [39] Jonathan Eckstein. "Parallel Branch-and-Bound Methods for Mixed-Integer Programming on the CM-5," *SIAM Journal on Optimization*, 4(4):794-814 (1994).
- [40] Jonathan Eckstein. "Some Saddle-Function Splitting Methods for Convex Programming," *Optimization Methods and Software* 4:75-83 (1994).
- [41] Jonathan Eckstein. "Alternating Direction Multiplier Decomposition of Convex Programs," *Journal of Optimization Theory and Applications* 80(1):39-62 (1994).

- [42] Randall S. Hiller and Jonathan Eckstein. "Stochastic Dedication: Designing Fixed-Income Portfolios using Massively Parallel Benders Decomposition," *Management Science* 39(11):1422-1438 (1993).
- [43] Jonathan Eckstein. "The Alternating Step Method for Monotropic Programming on the Connection Machine 2," *ORSA Journal on Computing* 5(1):84-96 (1993).
- [44] Jonathan Eckstein. "Nonlinear Proximal Point Algorithms using Bregman Functions, with Applications to Convex Programming," *Mathematics of Operations Research* 18(1):202-226 (1993).
- [45] Jonathan Eckstein and Dimitri P. Bertsekas. "On the Douglas-Rachford Splitting Method and the Proximal Point Algorithm for Maximal Monotone Operators," *Mathematical Programming* 55(3):293-318 (1992).
- [46] Dimitri P. Bertsekas and Jonathan Eckstein. "Dual Coordinate Step Methods for Linear Network Flow Problems," *Mathematical Programming* 42(2):203-243 (1988).
- [47] Yosef Sheffi and Jonathan Eckstein. "Optimization of Group Line-Haul Operations for Motor Carriers Using Twin Trailers," *Transportation Research Record* 1120:12-23 (1987).

Refereed Collections and Proceedings

- [48] Jonathan Eckstein, Noam Goldberg, and Ai Kagawa. "Rule-Enhanced Penalized Regression by Column Generation using Rectangular Maximum Agreement." *Proceedings of the 34th International Conference on Machine Learning (ICML 2017)*, appearing as *Proceedings of Machine Learning Research* 70:1059-1067 (2017).
- [49] Noam Goldberg and Jonathan Eckstein. "Boosting Classifiers with Tightened L0-Relaxation Penalties." *Proceedings of the 27th International Conference on Machine Learning (ICML 2010)*, 383-390 (2010).
- [50] Farid Alizadeh, Jonathan Eckstein, Nilay Noyan, and Gábor Rudolf. "Arrival Rate Approximation by Nonnegative Cubic Splines" (extended abstract), *Proceedings of the IEEE Electro/Information Technology (EIT) Conference*, Lincoln, NB, May 2005.
- [51] Jonathan Eckstein, Cynthia A. Phillips, and William E. Hart. "PICO: An Object-Oriented Framework for Parallel Branch and Bound," *Proceedings of the Workshop on Inherently Parallel Algorithms in Optimization and Feasibility and their Applications*, Haifa, Israel, March 2000, *Studies in Computational Mathematics*, Elsevier Scientific, Amsterdam, 219-265 (2001).
- [52] Jonathan Eckstein, William E. Hart and Cynthia Phillips. "Resource Management in a Parallel Mixed Integer Programming Package," *Intel Supercomputer Users Group Thirteenth Annual Conference*, June 1997, <http://www.cs.sandia.gov/ISUG97/>.
- [53] Dimitri P. Bertsekas, David Castañón, Jonathan Eckstein, and Stavros A. Zenios. "Parallel Computing in Network Optimization," in M. O. Ball, T. L. Magnanti, C. L. Monma, and G.

L. Nemhauser, eds., *Handbooks in Operations Research and Management Science 7*, Elsevier Scientific, Amsterdam, 331-399 (1995).

- [54] Jonathan Eckstein. "Control Strategies for Parallel Mixed Integer Branch and Bound," *Proceedings of Supercomputing '94*, IEEE Computer Society Press, Los Alamitos, CA, 41-48 (1994).
- [55] Jonathan Eckstein and Masao Fukushima. "Some Reformulations and Applications of the Alternating Direction Method of Multipliers," in *Large Scale Optimization: State of the Art*, W. W. Hager, D. W. Hearn, P. M. Pardalos, eds., Kluwer Academic, Dordrecht, 115-134 (1994).

Textbooks

- [56] Jonathan Eckstein and Bonnie R. Schultz. *Introduction to Relational Database Design for Business, with Microsoft Access*. Wiley, 2018, 328 pages.
- [57] Jonathan Eckstein. *Operations Management: an Introduction to Decision Analytics*, University Publishing Solutions, 2013, 420 pages. (and many earlier editions entitled *Operations Management*). Compendium of teaching materials for Rutgers undergraduate course 33:136:386 (formerly 33:623:386), predominantly consisting of original lecture notes.

Invited Publications

- [58] Jonathan Eckstein. "Parallel Computing," *Encyclopedia of Operations Research and Management Science*, S. I. Gass and C. M. Harris, eds., Kluwer Academic, Boston, pp. 483-485 (1996). Revised version in second edition (2001), pp. 601-603. Revised version for third edition, S. I. Gass and M. C. Fu, eds. (2013), pp. 1103-1107.
- [59] Jonathan Eckstein, William E. Hart and Cynthia Phillips "Massively Parallel Mixed-Integer Programming: Algorithms and Applications," Chapter 17 of *Parallel Processing for Scientific Computing*, M.A. Heroux, P. Raghavan, and H.D. Simon, editors, SIAM book series on Software, Tools, and Environments (based on 11th SIAM Conference on Parallel Processing for Scientific Computing), November 2006.
- [60] Jonathan Eckstein. "Parallel Branch-and-Bound Methods for Mixed Integer Programming," *SIAM News* 27(1):1,12-15 (1994). Updated version appears in the collection *Applications on Advanced Architecture Computers*, G. Astfalk, ed., SIAM, Philadelphia, 141-153 (1996).
- [61] Jonathan Eckstein. "Large-Scale Parallel Computing, Optimization, and Operations Research: A Survey," *ORSA Computer Science Technical Section Newsletter* 14(2), 1, 8-12, 25-28 (1993).
- [62] Dimitri P. Bertsekas and Jonathan Eckstein. "Distributed Asynchronous Relaxation Methods for Linear Network Flow Problems," *Automatic Control: World Congress*, 1987, R. Isermann, ed., Pergamon, Munich, 7:103-114 (1987).

Works under Review or in Process

- [63] Patrick R. Johnstone, Jonathan Eckstein, Thomas Flynn, and Shinjae Yoo. “Stochastic Projective Splitting: Solving Saddle-Point Problems with Multiple Regularizers,” submitted to the 35th conference on Neural Information Processing Systems (NeurIPS/NIPS), May 2021. (Competitive peer-reviewed conference)

Working Papers, Preprints, and Other Publications

(Includes preprint versions of refereed/invited/submitted publications appearing above; only co-authors listed; I am the lead or sole author unless otherwise noted.)

- [64] Patrick R. Johnstone, Jonathan Eckstein, Thomas Flynn, and Shinjae Yoo. “Stochastic Projective Splitting: Solving Saddle-Point Problems with Multiple Regularizers,” ArXiv preprint 2106.13067, June 2021.
- [65] Jonathan Eckstein. “Deriving Solution Value Bounds from the ADMM,” Optimization Online Preprint 2019-11-7490, November 2019.
- [66] M. Marques Alves, Jonathan Eckstein, Marina Geremia, and Jefferson G. Melo. “Relative-error inertial-relaxed versions of Douglas-Rachford and ADMM splitting algorithms,” Optimization Online preprint 2019-04-7175 and ArXiv preprint 1904.10502, April, 2019.
- [67] Patrick R. Johnstone and Jonathan Eckstein. “Single-Forward-Step Projective Splitting: Exploiting Cocoercivity,” ArXiv preprint 1902.09025, February 2019, updated version posted June 2019. Optimization Online preprint 2019-06-7259, June 2019.
- [68] Jonathan Eckstein and Gyorgy Matyasfalvi, “Efficient Distributed-Memory Parallel Matrix-Vector Multiplication with Wide or Tall Unstructured Matrices,” ArXiv preprint 1812.00904, December 2018.
- [69] Jonathan Eckstein, Jean-Paul Watson, and David L. Woodruff, “Asynchronous Projective Hedging for Stochastic Programming,” Optimization Online preprint 2018-10-6895, October 2018.
- [70] Patrick R. Johnstone and Jonathan Eckstein, “Projective Splitting with Forward Steps Requires only Continuity,” Optimization Online preprint 2018-09-6819 and ArXiv preprint 1809.07180, September 2018.
- [71] Patrick R. Johnstone and Jonathan Eckstein, “Convergence Rates for Projective Splitting,” Optimization Online preprint 2018-06-6657 and ArXiv preprint 1806.03920, June 2018.
- [72] Patrick R. Johnstone and Jonathan Eckstein, “Projective Splitting with Forward Steps: Asynchronous and Block-Iterative Operator Splitting,” Optimization Online E-print 2018-03-6533 and ArXiv preprint 1803.07043, March 2018.
- [73] Jonathan Eckstein. Letter to the editor, *The New York Times*, September 8, 2016.

- [74] Jonathan Eckstein. “A Simplified Form of Block-Iterative Operator Splitting and an Asynchronous Algorithm Resembling the Multi-Block ADMM,” Optimization Online E-print 2016-07-5533, July 2016.
- [75] Jonathan Eckstein and Wang Yao. “Approximate Versions of the Alternating Direction Method of Multipliers,” Optimization Online E-print 2016-01-5276, January 2016.
- [76] Patrick L. Combettes and Jonathan Eckstein. “Asynchronous Block-Iterative Primal-Dual Decomposition Methods for Monotone Inclusions,” ArXiv E-print 1507.03291, July 2015, updated November 2015.
- [77] Jonathan Eckstein and Wang Yao. “Understanding the Convergence of the Alternating Direction Method of Multipliers: Theoretical and Computational Perspectives,” E-print 2015-06-4954, Optimization Online, June 2015 (expanded version of paper with the same title in *Pacific Journal of Optimization*).
- [78] Welington de Oliveira and Jonathan Eckstein. “A Bundle Method for Exploiting Additive Structure in Difficult Optimization Problems,” E-print 2015-05-4935, Optimization Online May 2015.
- [79] Jonathan Eckstein and György Mátyásfalvi. “Object-Parallel Infrastructure for Implementing First-Order Methods, with an Example Application to LASSO,” E-print 2015-01-4748, Optimization Online, January 2015.
- [80] Jonathan Eckstein, William E. Hart, and Cynthia A. Phillips. “PEBBL 1.4.1 User’s Guide,” RUTCOR Research Report 2-2014, September 2014.
- [81] Jonathan Eckstein, Deniz Eskandani, and Jingnan Fan. “Multilevel Optimization Modeling for Risk-Averse Stochastic Programming,” working paper 2014-09-4516, Optimization Online, August 2014. RUTCOR Research Report 3-2014, September 2014.
- [82] Jonathan Eckstein, William E. Hart, and Cynthia A. Phillips. “PEBBL: An Object-Oriented Framework for Scalable Parallel Branch and Bound,” RUTCOR Research Report 9-2013, September 2013
- [83] Jonathan Eckstein. “Time Consistency Versus Law Invariance in Multistage Stochastic Optimization with Coherent Risk Measures: Multilevel Optimization Modeling and Computational Complexity,” RUTCOR Research Report RRR 7-2013, August 2013.
- [84] Jonathan Eckstein. “Augmented Lagrangian and Alternating Direction Methods for Convex Optimization: A Tutorial and Some Illustrative Computational Results,” RUTCOR Research Report RRR 32-2012, December 2012.
- [85] Jonathan Eckstein. “Complexity of Bilevel Coherent Risk Programming,” RUTCOR Research Report RRR 17-2012, April 2012.
- [86] Stephen Boyd, Neal Parikh, Eric Chu, Borja Peleato, and Jonathan Eckstein. *Distributed Optimization and Statistical Learning via the Alternating Direction Method of Multipliers*. http://www.stanford.edu/~boyd/papers/distr_opt_stat_learning_admm.html,

2011.

- [87] Jonathan Eckstein and Paulo J.S. Silva. “A Practical Relative Error Criterion for Augmented Lagrangians,” RUTCOR Research Report RRR 11-2010, July 2010.
- [88] Noam Goldberg and Jonathan Eckstein. “Sparse Weighted Voting Classifier Selection and its LP Relaxations,” RUTCOR Research Report RRR 9-2010, May 2010.
- [89] Noam Goldberg and Jonathan Eckstein. “Tightened L_0 -Relaxation Penalties for Classification,” RUTCOR Research Report RRR 23-2009, October 2009. Preliminary version awarded first prize in 2009 INFORMS New Jersey Chapter competition for best student paper.
- [90] Jonathan Eckstein and Noam Goldberg. “An Improved Branch-and-Bound Method for Maximum Monomial Agreement,” RUTCOR Research Report RRR 14-2009, July 2009, revised October 2009.
- [91] Jonathan Eckstein and Noam Goldberg. “An Improved Branch-and-Bound Method for Maximum Monomial Agreement,” OPT 2008 Optimization for Machine Learning Workshop, Neural Information Processing Systems Workshop (NIPS08), December 2008.
- [92] Jonathan Eckstein and Paulo J.S. Silva. “Proximal Methods for Nonlinear Programming: Double Regularization and Inexact Subproblems,” RUTCOR Research Report 17-2008, November 2008.
- [93] Jonathan Eckstein and Benar F. Svaiter. “General Projective Splitting Methods for Sums of Maximal Monotone Operators,” IMPA Preprint Serie A 547/2007, July 2007. RUTCOR Research Report 23-2007, August 2007.
- [94] Jonathan Eckstein, William E. Hart, and Cynthia A. Phillips. “PEBBL 1.0 User Guide,” RUTCOR Research Report 19-2006, August 2006 (first released on Sandia National Laboratories website August 2006).
- [95] Jonathan Eckstein, Avigdor Gal and Sarit Reiner. “Optimal Information Monitoring under a Politeness Constraint,” RUTCOR Research Report RRR 16-2005, May 2005.
- [96] Farid Alizadeh, Jonathan Eckstein, Nilay Noyan, and Gábor Rudolf. “Arrival Rate Approximation by Nonnegative Cubic Splines,” RUTCOR Research Report RRR 46-2004, December 2004. This report a much shorter and more condensed than the journal submission with the same title.
- [97] Jonathan Eckstein and Benar F. Svaiter. “Projective Splitting Methods for Pairs of Monotone Operators,” RUTCOR Research Report RRR 31-2003, August 2003.
- [98] Paulo J.S. Silva and Jonathan Eckstein. “Double-Regularization Proximal Methods, with Complementarity Applications,” RUTCOR Research Report RRR 29-2003, August 2003. Revised September 2004.

- [99] Jonathan Eckstein and Mikhail Nediak. "Depth-Optimized Convexity Cuts," RUTCOR Research Report RRR 23-2003, May 2003. Revised November 2003.
- [100] Jonathan Eckstein, Peter L. Hammer, Ying Liu, Mikhail Nediak, and Bruno Simeone. "The Maximum Box Problem and its Application to Data Analysis," RUTCOR Research Report RRR 4-2002, January 2002.
- [101] Mikhail Nediak and Jonathan Eckstein. "Pivot, Cut, and Dive: A Heuristic for Mixed 0-1 Integer Programming," RUTCOR Research Report RRR 53-2001, October 2001. Title change and very minor revisions, November 2001.
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Keynote/Plenary-Level Scholarly Presentations

1. *Parallel Computing and Numerical Optimization*. Plenary presentation, IV Latin American Workshop on Optimization and Control (LAWOC 2014), Lima, Peru, July 2014.
2. *Contributions to the Theory of the Alternating Direction Augmented Lagrangian Method*. One of four presentations at “A Celebration of Scholarship on the occasion of the publication of the 15th book by Dimitri Bertsekas”, Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, Cambridge, MA, May 2013.
3. *Augmented Lagrangian and Alternating Direction Methods for Convex Optimization: A Tutorial and Some Illustrative Computational Results*. Plenary presentation, INFORMS Computing Society Conference, Santa Fe, NM, January 2013.
4. *A Computational Evaluation of Alternating Direction Methods*. West Coast Optimization Meeting (WCOM 2011), University of British Columbia Okanagan, Kelowna, BC, Canada, October 2011. (Two non-West-Coast speakers per year are invited to give extra-length talks at this workshop.)
5. *A Practical Relative Error Criterion for the Classic Augmented Lagrangian*. West Coast Optimization Meeting (WCOM 2010), University of Washington (Department of Mathematics), Seattle, WA, May 2010. (Two non-West-Coast speakers per year are invited to give extra-length talks at this workshop.)
6. *Proximal Methods for Nonlinear Programming: Double Regularization and Inexact Subproblems*. Plenary presentation, VIII Brazilian Workshop on Continuous Optimization, Mambucaba/Angra dos Reis, Brazil, July 2009.

7. *A Projective Approach to Monotone Operator Splitting and Convex Programming Decomposition*. Plenary presentation, VII Brazilian Workshop on Continuous Optimization, University of Campinas, Brazil, July 2008.
8. *Projective Splitting Methods for Sums of Monotone Operators*. West Coast Optimization Meeting, University of Washington (Department of Mathematics), Seattle, WA, May 2008. (Two non-West-Coast speakers per year are invited to give extra-length talks at this workshop.)

Limited/Competitive Conference Presentations

1. *Projective Splitting Methods for Decomposing Convex Optimization Problems*. Workshop on Optimization Methods in Computer Vision and Image Processing, The Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Providence, RI, May 2019. (Speakers by invitation only)
2. *Some Open Topics in Projective Splitting Methods*. Workshop on Operator Splitting Methods in Data Analysis, Flatiron Institute, Simons Foundation, New York, NY, March 2019. (Attendance by invitation only)
3. *Projective Splitting with Cocoercive Operators*. Workshop on Numerical Algorithms in Nonsmooth Optimization, Erwin Schrödinger Institute for Mathematics and Physics, University of Vienna, Vienna, Austria, February 2019. (Speakers by invitation only)
4. *Parallel Branch and Bound from the Connection Machine CM-5 to PEBBL 2.0*. Workshop on Parallel Algorithms in Tree Search and Mathematical Optimization, Zuse Institute Berlin, Berlin, Germany, January 2019. (Speakers by invitation only)
5. *OR-Style Optimization Methods in Machine Learning*. Optimization and Discrete Math Program Review, Air Force Office of Scientific Research, Arlington, VA, August 2018. (Attendance for AFOSR grant principal investigators only)
6. *The ADMM, Progressive Hedging, and Operator Splitting*. DIMACS workshop on ADMM and Operator Splitting Methods in Optimization, Rutgers University, Piscataway, NJ, June 2018. (Speakers by invitation only)
7. *Projective Splitting with Forward Steps and Greedy Activation*. SAMSI workshop on Operator Splitting Methods in Data Analysis. The Statistical and Applied Mathematical Sciences Institute (SAMSI), Durham, NC, March 2018. (Attendance by invitation only)
8. *Asynchronous Parallel Applications of Block-Iterative Splitting*. Banff International Research Station CMO-BIRS workshop on Splitting Algorithms, Modern Operator Theory, and Applications, Oaxaca, Mexico, September 2017. (Attendance by invitation only)
9. *Rule-Enhanced Penalized Regression by Column Generation using Rectangular Maximum Agreement*. 34th International Conference on Machine Learning (ICML)

- 2017), Sydney, NSW, Australia, August 2017. (Competitive peer-reviewed conference)
10. *Coherent Risk-Adjusted Optimization*. AFOSR Discrete Mathematics and Optimization Program Review Meeting, Arlington, VA, December 2015 (presentation time shared with A. Ruszczyński). (Attendance for AFOSR grant principal investigators only)
 11. *Object-Parallel Solution of Large-Scale Lasso Problems*. Optimization and Big Data Workshop, University of Edinburgh, Edinburgh, Scotland, May 2015. (Speakers by invitation only)
 12. *Multilevel Optimization Modeling for Stochastic Programming with Coherent Risk Measures*. 7th Rutgers-Stevens Workshop on Optimization of Stochastic Systems, Rutgers University, Piscataway, NY, May 2015. (Speakers by invitation only)
 13. *Multilevel Models for Stochastic Programming with Coherent Risk Measures*. 2nd Rutgers Applied Probability Conference, Piscataway, NJ, December 2013.
 14. *Coherent Risk-Adjusted Decisions over Time: a Bilevel Programming Approach*. AFOSR Discrete Mathematics and Optimization Program Review Meeting, Arlington, VA, April 2013 (presentation time shared with A. Ruszczyński). (Attendance for AFOSR grant principal investigators only)
 15. *Coherent Risk-Adjusted Decisions over Time: A Bilevel Programming Approach*. AFOSR Discrete Mathematics and Optimization Program Review Meeting, Arlington, VA, April 2012 (presentation time shared with A. Ruszczyński). (Attendance for AFOSR grant principal investigators only)
 16. *A Survey of Parallelism in Solving Numerical Optimization and Operations Research Problems*. DIMACS Workshop on Parallelism: A 2020 Vision, Rutgers University, Piscataway, NJ, March 2011. (Speakers by invitation only)
 17. *The PEBBL Parallel Branch-and-Bound Library, and Quadratic Semi-Assignment for Peptide Docking and Design*. Computational Engineering and Science / High-Performance Computing Workshop, Lehigh University, Bethlehem, PA, October 2009. (Speakers by invitation)
 18. *n-Way Projective Operator Splitting*. 5th Rutgers-Stevens Workshop on Optimization of Stochastic Systems, Rutgers University, Piscataway, NJ, March 2009. (Speakers by invitation only)
 19. *Overview of the PEBBL and PICO Projects: Massively Parallel Branch and Bound*. DIMACS Workshop on COIN-OR, Rutgers University, Piscataway, NJ, July 2006. (Speakers by invitation only)
 20. *Rounding Heuristics and Ramp-Up Procedures for Parallel MIP*. PAREO 2005 Meeting on Parallel Processing in Operations Research, Mont Tremblant, Quebec, Canada, January 2005. (Speakers by invitation only)

21. *Parallel MIP Branch and Bound with PICO: Ramp-Up and Heuristic Incorporation*. DIMACS Reconnect Satellite Conference, Lafayette College, Easton, PA, June 2004. (Speakers by invitation only)
22. *Operator Splitting Methods and Monotone Affine Variational Inequalities*. MIT Optimization Day, Massachusetts Institute of Technology, Cambridge, MA, April 1995. (Speakers by invitation only)
23. *Control Strategies for Parallel Mixed Integer Branch and Bound*. Supercomputing '94, Washington, DC, November 1994. (Competitive peer-reviewed conference)
24. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. DIMACS Workshop on Parallel Processing of Discrete Optimization Problems, Rutgers University, Piscataway, NJ, April 1994. (Speakers by invitation only)
25. *Alternating Direction Methods for Optimization Problems in Operations Research: Theory and Practice*. Workshop on Decomposition and Parallel Computing Techniques for Large-Scale Systems, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, June 1994. (Speakers by invitation only)
26. *Parallel Branch-and-Bound Methods for Mixed-Integer Programming on the CM-5*. Symposium on Parallel Optimization 3, University of Wisconsin, Madison, WI, July 1993. (Speakers by invitation only)
27. Member of discussion panel on future directions in parallel systems. DIMACS Workshop on Future Directions in Parallel Optimization, Rutgers University, Piscataway, NJ, April/May 1993. (Speakers by invitation only)
28. *Remarks on Parallel Linear Programming*. DIMACS Workshop on Future Directions in Parallel Optimization, Rutgers University, Piscataway, NJ April/May 1993. (Speakers by invitation only)
29. *An Asynchronous Parallel Branch-and Bound Procedure for Mixed Integer Programming on the CM-5 — Preliminary Results*. DIMACS Workshop on Future Directions in Parallel Optimization, Rutgers University, Piscataway, NJ, April/May 1993. (Speakers by invitation only)

Invited Department-Level Scholarly Presentations

1. *Progressive Hedging and Asynchronous Projective Hedging for Convex Stochastic Programming*. Departmental seminar, Department of Mathematics, University of Hong Kong, April 2021 (delivered remotely).
2. *Progressive Hedging and Asynchronous Projective Hedging for Convex Stochastic Programming*. Departmental seminar, Department of Mathematics, Federal University of Santa Catarina, Florianopolis, Brazil, April 2021 (delivered remotely).

3. *Progressive Hedging and Asynchronous Projective Hedging for Convex Stochastic Programming*. Departmental seminar, Department of Mathematical Sciences, Rensselaer Polytechnic Institute, March 2021 (delivered remotely).
4. *Progressive Hedging and Asynchronous Projective Hedging for Convex Stochastic Programming*. One World Optimization Seminar (worldwide online seminar series organized during the pandemic), Department of Mathematics, University of Vienna, February 2021 (delivered remotely).
5. *Projective Splitting Methods for Monotone Inclusions and Convex Optimization*. Guest lecturer presentation in Industrial Engineering graduate seminar series, University of Illinois, Urbana, IL, February 2020.
6. *Projective Splitting Methods for Convex Optimization and Related Problems*. Algorithms seminar, Google Research, New York, NY, October 2019.
7. *Column Generation and Rectangular Maximum Agreement for Machine Learning: Classification and Regression*. Institute for Operations Research and Analytics (IORA), National University of Singapore, July 2019.
8. *Big Computing, Small Data: Applying Classical Mathematical Programming Techniques to Generalized Regression*. Department of Industrial and Systems Engineering, Lehigh University, February 2018.
9. *Asynchronous Projective Splitting for Convex Optimization and Monotone Inclusion Problems*. Department of Industrial and Systems Engineering, Lehigh University, November 2017.
10. *Asynchronous Projective Splitting for Convex Optimization and Monotone Inclusion Problems*. Department of Mathematics, National University of Singapore, July 2017.
11. *Approximate Versions of the Alternating Direction Method of Multipliers*. Numerical Analysis and Scientific Computing seminar, Courant Institute for Mathematical Sciences, New York University, April 2017.
12. *Asynchronous Projective Splitting for Convex Optimization and Monotone Inclusion Problems*. COCANA (Centre for Optimization, Convex Analysis, and Nonsmooth Analysis), University of British Columbia Okanagan, Kelowna, BC, Canada, December 2016.
13. *Approximate Versions of the Alternating Direction Method of Multipliers*. Center for Optimization and Statistical Learning, Northwestern University, November 2016.
14. *Asynchronous Projective Splitting for Convex Optimization and Monotone Inclusion Problems*. Microsoft Research, New York, NY, September 2016.
15. *Parallel Computing and Numerical Optimization*. Numerical Analysis and Scientific Computing seminar, Courant Institute of Mathematical Sciences, New York University,

- New York, NY, December 2015.
16. *Approximate Versions of the Alternating Direction Method of Multipliers*. Department of Mathematics, University of California Los Angeles, October 2015.
 17. *Asynchronous Projective Splitting for Monotone Operator Problems and Convex Optimization*. Industrial Engineering Colloquium, Pennsylvania State University, September 2015.
 18. *Approximate Versions of the Alternating Direction Method of Multipliers*. Singapore University of Technology and Design, Engineering Systems Design Distinguished Seminar Series, July 2015.
 19. *Multilevel Optimization Modeling for Stochastic Programming with Coherent Risk Measures*. Queen's School of Business, Queen's University, Kingston, Ontario, Canada, April 2015.
 20. *Approximate Versions of the Alternating Direction Method of Multipliers*. Department of Mathematics, Hong Kong Baptist University, March 2015.
 21. *Multilevel Optimization Modeling for Stochastic Programming with Coherent Risk Measures*. Department of Systems Engineering and Engineering Management, Chinese University of Hong Kong, March 2015.
 22. *How Can Numerical Optimization Algorithms Best Take Advantage of Parallel Computing?* Cyber Engineering Research Laboratory, Sandia National Laboratories, Albuquerque, NM, February 2015.
 23. *Approximate Versions of the Alternating Direction Method of Multipliers*. Optimization Seminar, department of Operations Research and Financial Engineering (ORFE), Princeton University, January 2015.
 24. *Approximate Versions of the Alternating Direction Method of Multipliers*. IEOR-DRO (Industrial Engineering and Operations Research / Decision, Risk, and Operations) seminar, Columbia University, November 2014.
 25. *Parallel Computing and Numerical Optimization*. IMECC Institute, University of Campinas (UNICAMP), Campinas, Brazil, October 2014.
 26. *Parallel Computing and Numerical Optimization*. Department of Mathematics, Federal University of Paraná, Curitiba, Brazil, October 2014.
 27. *Scalable Parallel Branch and Bound*. Department of Mathematics, National University of Singapore, July 2013.

28. *Complexity of Bilevel Coherent Risk Programming*. Department of Operations Research and Financial Engineering, Princeton University, September 2012.
29. *Complexity of Bilevel Coherent Risk Programming*. Department of Decision Sciences, National University of Singapore (NUS), August 2012.
30. *A Computational Evaluation of Alternating Direction Methods*. Engineering System Design seminar, Singapore University of Technology and Design, August 2012.
31. *Complexity of Bilevel Coherent Risk Programming*. Sandia National Laboratories Cyber Engineering Research Institute (CERI) seminar, June 2012.
32. *Stochastic Programming, Progressive Hedging, and Projective Operator Splitting*. Department of Decision Sciences, Drexel University, February 2009.
33. *Stochastic Programming, Progressive Hedging, and Projective Operator Splitting*. Mathematics seminar, IBM T.J. Watson Research Center, Yorktown Heights, NY, July 2008.
34. *Stochastic Programming, Progressive Hedging, and Projective Operator Splitting*. Computer Science Research Institute, Sandia National Laboratories, Albuquerque, NM June 2008.
35. *Stochastic Programming, Progressive Hedging, and Projective Operator Splitting*. Department of Operations Research and Financial Engineering, Princeton University, April 2008.
36. *Estimating Arrival Rate Functions of Nonhomogeneous Poisson Processes, and using them to Schedule Information Monitors*. Decision Sciences Department, Drexel University, April 2008.
37. *Monotone Operators and Splitting Methods: An Introduction and Some New Results*. Department of Mathematical Sciences, University of Delaware, November 2007.
38. *Estimating Arrival Rate Functions of Nonhomogeneous Poisson Processes, and using them to Schedule Information Monitors*. Supply Chain and Information Systems Department, Pennsylvania State University, October 2007.
39. *Two Optimization Models Arising from Nonhomogeneous Poisson Processes*. RUTCOR “brown bag” seminar, Rutgers University, March 2007.
40. *Scalable and Adaptable Parallel Branch and Bound: The PEBBL Library*. Institute for Defense Analysis Center for Communications Research, Princeton, NJ, February 2007.
41. *Two Optimization Models Arising from Polling and Nonhomogeneous Poisson Processes*. Department of Operations Research and Financial Engineering, Princeton University, October 2006.

42. *Data Replicas, Nonhomogeneous Poisson Processes, and Optimization*. Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil, June 2005.
43. *Rounding Heuristics and Ramp-Up Procedures for Parallel MIP*. Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil, June 2005.
44. *Data Replicas, Nonhomogeneous Poisson Processes, and Optimization*. Department of Computer Science, University of São Paulo, Brazil, June 2005.
45. *Rounding Heuristics and Ramp-Up Procedures for Parallel MIP*. Department of Computer Science, University of São Paulo, Brazil, June 2005.
46. *Pivot, Cut, and Dive Heuristics for General Mixed-Integer Programming*. Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, April 2003.
47. *Pivot, Cut, and Dive Heuristics for General Mixed-Integer Programming*. Department of Industrial and Systems Engineering, Lehigh University, April 2003.
48. *Stochastic Models of Relational Database Activity*. Department of Mathematical Sciences seminar series in stochastic systems, Stevens Institute of Technology, Hoboken, NJ, March 2003.
49. “Integer Programming Lunch” presentation with Mikhail S. Nediak. IBM T.J. Watson Research Center, Yorktown Heights, NY, April 2001.
50. *The PICO Approach to Parallel Branch and Bound*. Operations Research and Financial Engineering Department, Princeton University, November 2000.
51. *PICO: an Object-Oriented Framework for Parallel Branch and Bound*. Mathematical Sciences seminar, IBM T.J. Watson Research Center, Yorktown Heights, NY, November 2000.
52. *An Adaptable Parallel Toolbox for Branching Algorithms*. Johns Hopkins University Mathematical Sciences Department seminar, November 1999.
53. *Smooth Methods of Multipliers for Complementarity Problems*. Department of Civil Engineering and Operations Research, Princeton University, February 1997.
54. *Dual and Primal-Dual Formulations of Monotone Complementarity Problems*. RUTCOR “Brown Bag” seminar, Rutgers University, November 1996.
55. *Splitting Methods and Affine Variational Inequalities, with a Parallel Application to Optimal Control*. Mathematical Sciences Colloquium, Worcester Polytechnic Institute, Worcester, MA, February 1995.

56. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Department of Industrial and Operations Engineering, University of Michigan, February 1995.
57. *Splitting Methods and Affine Variational Inequalities, with a Parallel Application to Optimal Control*. Department of Computer Science and Operations Research, University of Montreal, January 1995.
58. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Sandia National Laboratories, Albuquerque, NM, January 1995.
59. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. RUTCOR, Rutgers University, January 1995.
60. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Bellcore Applied Research Center, Morristown, NJ, November 1994.
61. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Centre de Recherche sur les Transports, University of Montreal, October 1994.
62. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Department of Mathematical Sciences, Rensselaer Polytechnic Institute, September 1994.
63. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Supercomputing Research Center, Bowie, MD, May 1994.
64. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Department of Computational and Applied Mathematics, Rice University, Houston, TX, March 1994.
65. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5*. Department of Industrial and Systems Engineering, Georgia Institute of Technology, February 1994.
66. *A Survey of Parallel Numerical Optimization and Operations Research Techniques on Connection Machines*. Department of Informatics, University of Karlsruhe (Germany), June 1994.
67. *Highly Parallel Optimization in Operations Research: A Survey and Case Study*. USAir Operations Research Group seminar series, June 1993.
68. *The CM-5 Multiprocessor System and Parallel Numerical Optimization*. Graduate School of Industrial Administration, Carnegie-Mellon University, April 1993.
69. *A Branch-and-Bound Method for Mixed Integer Programming on the CM-5*. Department of Computer Science, University of Wisconsin, Madison, March 1993.

70. *Progress towards Massively Parallel Optimization*. Lecture for summer course 15.08s, “New Technologies for Decision Support,” Sloan School of Management, Massachusetts Institute of Technology, July 1992.
71. *An Application of Massively Parallel Benders Decomposition and the Dense Simplex Method on the Connection Machine CM-2*. Department of Industrial Engineering and Management Science, Northwestern University, March 1992.
72. *An Application of Massively Parallel Benders Decomposition and the Dense Simplex Method on the Connection Machine CM-2*. Mathematical Sciences Department, Rice University, February 1992.
73. *Bregman Function Methods for Convex Programming*. Department of Operations Research, Yale University, November 1991.
74. *A Splitting Method for Parallel Network Optimization on the Connection Machine*. Brown University, Department of Applied Mathematics, February 1991.
75. *Stochastic Portfolio Optimization: Massively Parallel Benders Decomposition*. MIT Operations Research Center, November 1990 (presentation time shared with R. S. Hiller).
76. *The Alternating Step Method for Linear Programming and Its Adventures on the CM-2*. Thinking Machines Corp., Cambridge, MA, February 1990.

Non-Limited Conference Scholarly Presentations

1. *In Memory of Dave Shanno: Obtaining Objective Bounds from the ADMM*. INFORMS Annual Meeting, online, November 2020.
2. *A Branch-and-Bound Algorithm for Rectangular Maximum Agreement*. INFORMS Annual Meeting, Seattle, WA, October 2019.
3. *Projective Splitting with Co-Coercive Operators*. International Conference on Continuous Optimization (ICCOPT 2019), Berlin, Germany, August 2019.
4. *Supporting an Additional Level of Parallelism in PEBBL 2.0*. INFORMS Annual Meeting, Phoenix, AZ, November 2018.
5. *Block-Iterative and Asynchronous Projective Splitting for Monotone Operators*. 23rd International Symposium on Mathematical Programming (ISMP 2018), Bordeaux, France, July 2018.
6. *OPAL: Building Parallel Augmented Lagrangian Solvers without Decomposition*. INFORMS Optimization Society meeting, Denver, CO, March 2018.

7. *Parallel Branch-and-Bound Algorithms for Rectangular Maximum Agreement*. INFORMS National Meeting, Houston, TX, October 2017.
8. *Asynchronous Parallel Operator Splitting Methods for Convex Stochastic Programming*. SIAM Conference on Optimization, Vancouver, BC, Canada, May 2017.
9. *An Asynchronous Parallel Stochastic Programming Algorithm Resembling Progressive Hedging*. INFORMS Computing Society Conference, Austin, TX, January 2017.
10. *Asynchronous ADMM-Like Optimization Algorithms*. INFORMS National Meeting, Nashville, TN, November 2016.
11. *Asynchronous Projective Monotone Operator Splitting Algorithms*. International Conference on Continuous Optimization (ICCOPT 2016), Tokyo, Japan, August 2016.
12. *Asynchronous Projective Monotone Operator Splitting Algorithms*. INFORMS Optimization Society Conference (IOS 2016), Princeton, NJ, March 2016.
13. *Asynchronous Projective Progressive-Hedging-Like Stochastic Programming Decomposition Methods*. INFORMS National Meeting, Philadelphia, PA, November 2015.
14. *Incremental Projective Splitting for Sums of Maximal Monotone Operators*. 22nd International Symposium on Mathematical Programming (ISMP 2015), Pittsburgh, PA, July 2015.
15. *Approximate Versions of the Alternating Direction Method of Multipliers*. INFORMS Computing Society Conference, Richmond, VA, January 2015.
16. *Massively Parallel Branch and Bound with PEBBL*. INFORMS National Meeting, San Francisco, CA, November 2014.
17. *Approximate Versions of the Alternating Direction Method of Multipliers*. LOT (Logistics, Optimization, and Transportation) 2014 conference, Molde, Norway, September 2014.
18. *Multilevel Optimization Modeling for Stochastic Programming with Coherent Risk Measures*. SIAM Conference on Optimization (SIOPT 14), San Diego, CA, May 2014.
19. *Multilevel Optimization Modeling for Stochastic Programming with Coherent Risk Measures*. X Brazilian Workshop on Continuous Optimization (X BRAZOPT), Florianopolis, Brazil, March 2014.
20. *Multilevel Models for Stochastic Programming with Coherent Risk Measures*. INFORMS National Meeting, Minneapolis, MN, October 2013.
21. *Object-Parallel Implementation of a Bound-Constrained Conjugate Gradient Solver*. 4th International Conference on Continuous Optimization (ICCOPT 2013), Caparica/Lisbon, Portugal, July 2013.

22. *Complexity of Bilevel Coherent Risk Programming*. INFORMS National Meeting, Phoenix, AZ, November 2012.
23. *Alternating Direction Methods and Relative Error Criteria for Augmented Lagrangians*. 21st International Symposium on Mathematical Programming (ISMP), Berlin, Germany, August 2012
24. *A Computational Evaluation of Alternating Direction Methods*. INFORMS National Meeting, Charlotte, NC, November 2011.
25. *A Simple Python Load Visualization Tool for the PEBBL Parallel Branch-and-Bound Package*. INFORMS Computing Society Conference, Monterey, CA, January 2011.
26. *A Practical Relative Error Criterion for the Classic Augmented Lagrangian*. INFORMS National Meeting, Austin, TX, November 2010.
27. *A Practical Relative Error Criterion for the Classic Augmented Lagrangian*. International Conference on Continuous Optimization (ICCOPT 2010), Santiago, Chile, July 2010.
28. *Modern First-Order Augmented Lagrangian Methods for Nonlinear Programming*. INFORMS National Meeting, San Diego, CA, October 2009.
29. *The PEBBL Parallel Branch-and-Bound Library*. INFORMS National Meeting, San Diego, CA, October 2009.
30. *Projective Splitting and Projective Hedging*. 20th International Symposium on Mathematical Programming (ISMP), Chicago, IL, August 2009.
31. *Branch-and-Bound Methods for the Maximum Monomial Agreement Problem*. INFORMS Computing Society Conference, Charleston, SC, January 2009.
32. *Surrogate-Objective MIP Heuristics*. INFORMS Computing Society Conference, Charleston, SC, January 2009.
33. *Dedicated to Mike Rothkopf: Monitoring an Information Source under a Politeness Constraint*. INFORMS National Meeting, Washington, DC, October 2008.
34. *Surrogate-Objective MIP Heuristics*. INFORMS National Meeting, Washington, DC, October 2008.
35. *Enumeration of Near-Optimal Solutions in Parallel Branch and Bound*. INFORMS National Meeting, Seattle, WA, November 2007.
36. *General Projective Splitting for Monotone Operators*. International Conference on Continuous Optimization (ICCOPT) II, Hamilton, Ontario, August 2007.
37. *Incorporating Cutting Planes into the PICO Mixed Integer Solver*. 2006 INFORMS National Meeting, Pittsburgh, PA, November 2006.

38. *General Projective Splitting for Monotone Operators*. 19th International Symposium on Mathematical Programming (ISMP), Rio de Janeiro, Brazil, July 2006.
39. *Rounding Heuristics and Ramp-Up Procedures for Parallel MIP*. INFORMS Computing Society Conference, Annapolis, MD, January 2005.
40. *Parallel MIP Branch and Bound with PICO: Ramp-Up and Heuristic Incorporation*. CORS-INFORMS International Meeting, Banff, Alberta, Canada, May 2004.
41. *Pivot, Cut, and Dive: A Class of Heuristics for General MIP*. 18th International Symposium on Mathematical Programming (ISMP), Lyngby, Denmark, August 2003.
42. *The PICO Package for Parallel Branch and Bound: Recent Developments*. INFORMS National Meeting, San Jose, CA, November 2002.
43. *Pivot, Cut, and Dive: An Embarrassingly Parallel Heuristic for Mixed Integer Programming*. PAREO 2002 Meeting on Parallel Processing in Operations Research, Guadeloupe, France, May 2002.
44. *PICO: An Object-Oriented Toolbox for Parallel Branch and Bound*. PAREO 2002 Meeting on Parallel Processing in Operations Research, Guadeloupe, France, May 2002.
45. *PICO: A Massively Parallel Branch-and-Bound Toolbox*. Fields Institute workshop on Novel Approaches to Hard Discrete Optimization, Waterloo, ON, Canada, April 2001.
46. *The PICO Parallel Branch and Bound System*. 17th International Symposium on Mathematical Programming (ISMP), Atlanta, GA, August 2000.
47. *An Adaptable Parallel Toolbox for Branching Algorithms*. INFORMS Computer Science Technical Section conference, Monterey, CA, January 1998.
48. *An Adaptable Parallel Toolbox for Branching Algorithms*. International Symposium on Mathematical Programming, Lausanne, Switzerland, August 1997.
49. *Smooth Methods of Multipliers for Complementarity Problems*. 16th International Symposium on Mathematical Programming (ISMP), Lausanne, Switzerland, August 1997.
50. *Smooth Methods of Multipliers for Complementarity Problems*. INFORMS National Meeting, San Diego, CA, May 1997.
51. Member of discussion panel on tools for parallel combinatorial optimization. POC96 Parallel Optimization Colloquium, Versailles, France, March 1996.
52. *How Much Communication Does Parallel Branch and Bound Need?* POC96 Parallel Optimization Colloquium, Versailles, France, March 1996.

53. *A Parallel Operator-Splitting Approach to Some Discrete-Time Optimal Control Problems.* POC96 Parallel Optimization Colloquium, Versailles, France, March 1996.
54. *How Much Communication Does Parallel Branch and Bound Need?* INFORMS Computing Society Technical Section conference, Dallas, TX, January 1996.
55. *A Parallel Operator-Splitting Approach to Some Discrete-Time Optimal Control Problems.* INFORMS Computer Science Technical Section (CSTS) conference, Dallas, TX, January 1996.
56. *How Much Communication Does Parallel Branch and Bound Need?* INFORMS National Meeting, New Orleans, LA, October/November 1995.
57. *A Parallel Operator-Splitting Approach to Some Discrete-Time Optimal Control Problems.* INFORMS National Meeting, New Orleans, LA, October/November 1995.
58. *Central Versus Distributed Control in Parallel Mixed Integer Branch and Bound on the CM-5.* INFORMS National Meeting, Los Angeles, CA, April 1995.
59. *Parallel Branch-and-Bound Techniques for General Mixed Integer Programming on the CM-5.* 15th International Mathematical Programming Symposium (ISMP), Ann Arbor, MI, August 1994.
60. *Parallel Solution of Linear Programs via Nash Equilibria.* 15th International Mathematical Programming Symposium, Ann Arbor, MI, August 1994 (presentation time shared with M. Kallio).
61. *An Alternating Direction Method for Convex Transportation Problems.* TIMS/ORSA national meeting, Boston, MA, April 1994.
62. *Asynchronous Branch-and-Bound Algorithms on the CM-5.* TIMS/ORSA national meeting, Phoenix, AZ, November 1993.
63. *Massively Parallel Linear and Mixed Integer Programming: A Survey.* TIMS/ORSA national meeting, Chicago, IL, May 1993.
64. *An Epigraphic Projection Method: Parallel Application of Douglas-Rachford Splitting to Block-Separable Convex Programming.* TIMS/ORSA National meeting, Chicago, IL, May 1993.
65. *An Asynchronous Parallel Branch-and Bound Procedure for Mixed Integer Programming on the CM-5 — Preliminary Results.* Conference on Large Scale Optimization, Gainesville, FL, February 1993.
66. *Progress in Linear and Mixed Integer Programming on Connection Machines.* ORSA/TIMS national meeting, San Francisco, CA, November 1992.
67. *Some Saddle-Function Splitting Methods for Convex Programming.* SIAM Conference on Optimization, Chicago, IL, May 1992.

68. *Progress Toward Massively Parallel LP Solvers on the Connection Machine.* TIMS/ORSA national meeting, Orlando, FL, April 1992.
69. *Managing Asset/Liability Portfolios via Stochastic Programming: Massively Parallel Benders' Decomposition on the Connection Machine CM-2.* TIMS/ORSA national meeting, Nashville, TN, May 1991.
70. *A Massively Parallel Alternating Step Method for Quadratic-Cost Generalized Network Problems: Computational Experience on the Connection Machine 2.* TIMS/ORSA national meeting, Nashville, TN, May 1991.
71. *Nonlinear Proximal Point Algorithms using Bregman Functions, with Applications to Convex Programming.* ORSA/TIMS national meeting, Philadelphia, PA, October 1990.
72. *Implementing the Alternating Step Method on the Connection Machine.* ORSA/TIMS national meeting, New York, NY, October 1989.
73. *Operator Splitting and Parallel Methods for Linear Programming.* Third SIAM Conference on Optimization, Boston, MA, April 1989.
74. *A Parallel Method for Linear Programming, as Applied to Networks.* ORSA/TIMS national meeting, Denver, CO, October 1988.
75. *Efficient Use of Twin-Trailer Trucks.* TIMS/ORSA national meeting, Los Angeles, CA, April 1986.

Community Outreach and Miscellaneous Presentations

1. *Business Analytics and Information Technology.* Career day presentation for “Futuro” organization for immigrant youth from the Trenton and Princeton, NJ areas, Princeton, NJ, December 2018.

Postdoctoral Fellows Supervised

July 2017-August 2020. Patrick Johnstone. Theoretical and computational research into projective splitting methods.

Doctoral Dissertations Supervised

Starting July 2021. Chang Yu, Ph.D. in Management program, Operations Research concentration, Rutgers University (new student).

September 2013-December 2019. Deniz Seyed Eskandani, Ph.D. in Management program, Management Science concentration. Rutgers University. Dissertation title: *Risk-Averse Decision Making and Bilevel Stochastic Programming.*

January 2013-September 2018. Ai Kagawa, Ph.D. in Operations Research Program, Rutgers University. Dissertation title: *The Rectangular Maximum Agreement Problem: Applications and Parallel Solution*.

May 2012-May 2018. Gyorgy Matyasfalvi, Ph.D. in Operations Research Program, Rutgers University. Dissertation title: *OPOS: Object-Parallel Optimization Software*.

January 2011-July 2016: Wang Yao, Ph.D. in Operations Research Program, Rutgers University. Dissertation title: *Approximate Versions of the Alternating Direction Method of Multipliers*.

September 2009-March 2014: Matthew Oster, Ph.D. in Operations Research Program, Rutgers University. Dissertation title: *Two Applications of Combinatorial Optimization*.

May 2007-October 2009: Noam Goldberg, Ph.D. in Operations Research Program, Rutgers University. Joint paper "Tightened L_0 -Relaxation Penalties for Classification" awarded 2009 INFORMS New Jersey Chapter contest for best student paper. Dissertation title: *Optimization for Sparse and Accurate Classifiers*.

May 2000-September 2002: Mikhail Nediak, Ph.D. in Operations Research Program, Rutgers University. Dissertation title: *Convexity Cuts and Integrality Merit Functions for Mixed-Integer Programming*.

Dissertation Work Co-Supervised

July 1999-December 2000: Paulo José da Silva e Silva, doctoral student, Applied Mathematics, University of São Paulo. Visited RUTCOR under my supervision July 1999-December 1999, working on proximal algorithms for nonlinear programming and variational inequalities. This work formed the bulk of his dissertation.

Other Doctoral Supervision

October 2011-June 2012. Supervised research of Jingnan Fan, Operations Research Program, Rutgers University, working on modeling and solution of risk-averse multistage decision problems.

September 2001-September 2002: supervising research assistantship for Konrad Borys, Ph.D. in Operations Research Program, Rutgers University. Work involved C++ implementation improvements to the PICO parallel branch-and-bound software library.

September 1996-June 1997: Teemu Pennanen, Ph.D. in Operations Research program, Rutgers University. Supervised research in various topics relating to convex analysis and monotone operators (this student transferred to the University of Washington to work with R. T. Rockafellar).

Summer 1993: Lazaros Polymenakos, Department of Electrical Engineering, and Computer Science, MIT. Supervised work on parallel simplex algorithms.

External Dissertation Examination

August 2017-September 2017: external examiner for dissertation of Wang Kai, Ph.D. in School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore. Paid external examiner; did not attend defense in person.

October 2016-December 2016: external examiner for dissertation of Walaa Moursi, Ph.D. in Mathematics, University of British Columbia Okanagan (principal advisor, Heinz Bauschke). Present in person at dissertation defense.

July 2003-September 2003: dissertation evaluator for Maknoun Zaknoon, Department of Mathematics, University of Haifa, Israel (principal advisor: Yair Censor).

Dissertation Committees

November 2018-November 2019: dissertation committee of Marta Cavaleiro, Ph.D. in Operations Research Program, Rutgers University (principal advisor: Farid Alizadeh).

January 2016-April 2017: dissertation committee of Yu Du, Ph.D. in Operations Research program, Rutgers University (principal advisors: Xiaodong Lin and Andrzej Ruszczyński).

December 2016-April 2018: dissertation committee member for Mohammed Ranjbar, Ph.D. in Operations Research program, Rutgers University (principal advisor: Farid Alizadeh).

May 2013-September 2013: dissertation committee member for Tsvetan Asamov, Ph.D. in Operations Research program, Rutgers University (principal advisor: Andrzej Ruszczyński).

Spring 2011: external dissertation committee member for Shiqian Ma, department of Industrial Engineering and Operations Research, Columbia University (principal advisor: Donald Goldfarb).

August 2010-February 2011: dissertation committee of David Papp, Ph.D. in Operations Research Program, Rutgers University (principal advisor: Farid Alizadeh).

May 2010-August 2010: dissertation committee of Ricardo Collado, Ph.D. in Operations Research Program, Rutgers University (principal advisor: Andrzej Ruszczyński).

September 2008-May 2009: dissertation committee of Naomi Miller, Ph.D. in Operations Research Program, Rutgers University (principal advisor: Andrzej Ruszczyński).

March 2003-June 2004: dissertation committee of Miguel Lejeune, Ph.D. in Management program, Rutgers University (principal advisor: Andrzej Ruszczyński).

January 2001-May 2003: dissertation committee of Yu Xia, doctoral student, Ph.D. in Management program, Rutgers University (principal advisor: Farid Alizadeh).

April 1997: David Rader, Ph.D. in Operations Research program, Rutgers University. Served on dissertation reading committee (principal advisor: Peter L. Hammer).

September 1994-May 1997: I. Ilkay Boduroglu, Department of Industrial Engineering and Operations Research. Assisted D. Goldfarb in supervising research on parallel simplex algorithms. Served on dissertation committee.

Undergraduate Student Projects

The projects below were independent study projects for credit, unless otherwise noted.

September 2020-May 2021: Sandra Alex, Rutgers University undergraduate honors student, BAIT major. Supervised an honors project and thesis to build a relational database to support the operations of the Rutgers Center for Adult Autism Services (RCAAS) College Support Program (CSP). This program supports students with autistic spectrum disorder who are attending Rutgers. The database replaced numerous spreadsheets that the program used for record keeping and had to be manually kept in synchronization with one another.

January 2019-May 2019: Sohum Sanghvi, Rutgers University undergraduate student, BAIT major. Improvements to YASAI simulation add-in (including hypothesis testing and the ability to dump internal data tables to a worksheet).

January 2017-May 2017: Ying Lu, Rutgers University undergraduate student, BAIT major. Improvements to YASAI simulation add-in.

January 2016-May 2016: Tonghong Chen, Rutgers University undergraduate students, BAIT major. Improvements to YASAI simulation add-in.

January 2016-May 2016: Yingxuan Mo, Rutgers University undergraduate students, BAIT major. Improvements to YASAI simulation add-in.

September 2013-December 2013: Angela Chen, Rutgers University undergraduate student, BAIT major. Improvements to YASAI simulation add-in, including Macintosh compatibility and redesign of website.

September 2006-February 2007: Shane Reed, Rutgers University undergraduate student, MSIS major. Improvements to YASAI simulation add-in: geometric random number generator, improved installation procedure, more flexible output support, foreign language Excel compatibility, and improved graphics.

September 2005-December 2005: Eric Duelfer, Rutgers University undergraduate student, MSIS major. Independent study in elementary JAVA programming.

January 2005-May 2005: George Dyer, Rutgers University undergraduate student, MSIS major. Project to complete addition of graphics capability to YASAI. Created “installer” application for YASAI.

January 2003-May 2003: Philip Fickas, Rutgers University undergraduate student, MSIS major. Added graphics capability to YASAI.

January 2002-May 2002: Justin Sarnak, Rutgers University undergraduate student, MSIS major. Added improved random number generator and made other enhancements to YASAI software.

September 2001-January 2002: Hesham Osman, Rutgers University undergraduate student, MSIS major. Continued development of YASAI software.

June 2000-May 2001: Steven Riedmuller, Rutgers University undergraduate, Livingston College honors program and MSIS major. Supervising senior honors project to write YASAI, spreadsheet-based simulation software to replace “@Risk” in the business computer lab.

Courses Taught (Alphabetical Order)

Advanced Operations Management. Undergraduate program, Business School, Rutgers University, New Brunswick, NJ, Fall 2005, Fall 2006. Required course for undergraduate MSIS-major seniors. Topics include inventory modeling, decision trees, critical fractile analysis, deterministic and stochastic dynamic programming, queuing, simulation, and time-series forecasting (topics varied somewhat by year).

Analytical Techniques, International executive MBA program, Business School, Rutgers University, December 2007 (Beijing), December 2009 (Beijing), December 2010 (Beijing), August 2011 (Shanghai), December 2011 (Beijing), July/August 2012 (Singapore), June/July 2013 (Singapore), June/July 2014 (Singapore), July/August 2015 (Singapore), July/August 2016 (Singapore), July/August 2017 (Singapore), July/August 2018 (Singapore), July/August 2019 (Singapore), July/August 2020 (remote to Singapore). Condensed 9-day introduction to optimization, decision trees, and stochastic modeling for executive MBA students (16 days long when taught remotely).

Business Decision Analytics under Uncertainty. Undergraduate program, Business School, Rutgers University, New Brunswick, NJ, Fall 2013, Fall 2015, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Spring 2020 (partially remote), Fall 2020 (remote), Spring 2021 (remote). Required course for students in the BAIT (Business Analytics and Information Technology) major. Topics include decision trees, critical fractile analysis, deterministic and stochastic dynamic programming, numerical algorithms in Python (or JavaScript in Fall 2013), queuing, and various kinds of simulation.

Convex Analysis and Optimization. Doctoral program, RUTCOR, Rutgers University, New Brunswick, NJ, Spring 2009 (under temporary title *Special Topics in Operations Research*), Fall 2011, Fall 2013 (under temporary title *Special Topics in Management Science*). Course introducing convex finite-dimensional convex analysis and some of its applications in convex and nonconvex optimization.

Managerial Economics. MBA program, Harvard University, Graduate School of Business, September 1989-January 1990, November 1990-March 1991. Required first-year MBA course stressing quantitative methods, including linear programming, decision analysis, linear regression, and some game theory (also included elementary stochastic simulation in the 1989-1990 school year).

Management Information Systems. Undergraduate program, Business School, Rutgers University, New Brunswick, NJ, Fall 1995, Spring 1996, Fall 2004, Fall 2005-Spring 2007, Fall 2008, Spring 2011, Spring 2012-Fall 2013, Spring 2014, Fall 2015. Required course for most

business majors, stressing relational database design, database software, and the role of information technology in the firm. Course coordinator 2006-2013.

Nonlinear Optimization. Graduate School Newark (distance-learning networked between Newark and New Brunswick campuses), Rutgers University, Fall 2019. Doctoral course taken graduate students in business and engineering (and also numerous auditors).

Nonlinear Optimization. Graduate School New Brunswick, Rutgers University, Spring 2013. Doctoral/masters course taken graduate students in business, operation research, various engineering disciplines, and management science.

Nonlinear Optimization. Doctoral and Masters programs, School of Engineering and Applied Sciences, Princeton University, Spring 2008. Taught while on sabbatical at Princeton. Theoretical doctoral course on nonlinear optimization, with students from Operations Research and Financial Engineering (ORFE), various other engineering departments, and Finance.

Nonlinear Programming. Doctoral program, Business School, Rutgers University, New Brunswick NJ, Spring 1998, Spring 1999. Theoretical doctoral course on nonlinear optimization algorithms, with students from management science, operations research, mathematics, and electrical engineering programs.

Operations Management. International executive MBA program, Business School, Rutgers University, Shanghai, China, January 2006. Condensed 9-day introduction to optimization and stochastic modeling for executive MBA students, with some material on supply chain management. Taught in English to a mixture of expatriates and Chinese nationals.

Operations Management. Undergraduate program, Business School, Rutgers University, New Brunswick, NJ, Fall 1996-Spring 2004, Spring 2005, Fall 2009, Spring 2010. Required course for all undergraduate business majors, stressing introductory management science concepts, including linear programming modeling, integer programming modeling, and stochastic simulation. Redesigned curriculum to improve focus and, increase use of computers, and employ spreadsheet modeling. Course coordinator Fall 1997-Spring 2013. Developed extensive course materials that completely replaced the usual textbook by Fall 2003. Acted as liaison with computer science department on content of CS 170, a prerequisite course. Devised “Excel proficiency exam” for certain students entering the business school.

For experience as a teaching assistant, see “Work Experience” above.

Teaching Ratings

Teaching effectiveness and course quality ratings are on a 1-to-5 scale. All courses are at Rutgers University unless otherwise noted. Shaded cells indicate data that were not collected or are not available. Teaching ratings from Harvard Business School in 1989-1991 are not available and not included below.

Year	Term	Course Number	Course Name	Course Type	Enrolled	Respond	Teaching Effectiveness	Course Quality
2021	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate / online	61	21	4.14	3.95

Year	Term	Course Number	Course Name	Course Type	Enrolled	Respond	Teaching Effectiveness	Course Quality
2021	Spring	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate / online	56	25	4.36	3.96
2020	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate / online	46	20	4.40	4.40
2020	Fall	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate / online	44	15	4.40	4.33
2020	--	22:711:573:75	Analytical Techniques	International EMBA	5	1		
2020	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate / partially online	53	18	4.17	4.06
2018	Fall	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate / partially online	55	21	4.38	4.29
2019	Fall	26:711:751:01/ 26:711:751:02	Nonlinear Optimization	Doctoral	5	3	5.00	5.00
2019	--	22:711:573:75	Analytical Techniques	International EMBA	16	4	4.75	5.00
2019	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	53	23	4.78	4.74
2018	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	49	30	4.80	4.77
2018	Fall	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate	50	24	4.92	4.92
2018	--	22:711:573:76	Analytical Techniques	International EMBA	11	3	3.00	3.00
2018	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	28	14	4.71	4.57
2018	Spring	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate	28	14	4.85	4.85
2017	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	40	21	4.90	4.81
2017	Fall	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate	48	23	4.70	4.61
2017	--	22:711:573:75	Analytical Techniques	International EMBA	12	9	4.33	4.33
2017	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	22	9	4.44	4.44
2017	Spring	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	22	10	5.00	5.00
2016	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	49	20	4.60	4.60
2016	Fall	33:136:400:02	Business Decision Analytics Under Uncertainty	Undergraduate	58	16	4.75	4.75
2016	--	22:711:573:75	Analytical Techniques	International EMBA	22	11	4.27	4.00
2016	Spring	33:136:370:03	Management Information Systems	Undergraduate	47	27	4.67	4.70
2016	Spring	33:136:370:04	Management Information Systems	Undergraduate	55	25	4.56	4.40
2015	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	85	25	4.79	4.58
2015	Fall	33:136:370:02	Management Information Systems	Undergraduate	40	12	4.64	4.55

Year	Term	Course Number	Course Name	Course Type	Enrolled	Respond	Teaching Effectiveness	Course Quality
2015	--	22:711:573:75	Analytical Techniques	International EMBA	17	16	4.56	4.50
2014	--	22:711:573:75	Analytical Techniques	International EMBA	20	16	4.13	4.25
2014	Spring	33:136:370:03	Management Information Systems	Undergrad Core	40	18	4.47	4.35
2014	Spring	33:136:370:04	Management Information Systems	Undergrad Core	40	19	4.89	4.79
2013	--	22:711:573:75	Analytical Techniques	International EMBA	13	9	4.33	4.22
2013	Fall	26:711:685:03	Convex Analysis and Optimization (Special Topic)	Graduate	11	8	4.86	5.00
2013	Fall	33:136:400:01	Business Decision Analytics Under Uncertainty	Undergraduate	44	21	4.40	4.20
2013	Spring	16:711:550:01	Nonlinear Optimization	Graduate	22	20	4.65	4.75
2013	Spring	33:623:370:04	Management Information Systems	Undergrad Core	40	22	4.50	4.29
2012	--	22:711:573:75	Analytical Techniques	International EMBA	14	8	3.75	3.88
2012	Fall	33:623:370:02	Management Information Systems	Undergrad Core	36	16	4.73	4.56
2012	Fall	33:623:370:03	Management Information Systems	Undergrad Core	37	19	4.50	4.37
2012	Spring	33:623:370:03	Management Information Systems	Undergrad Core	36	14	4.50	4.36
2012	Spring	33:623:370:04	Management Information Systems	Undergrad Core	36	12	4.82	4.75
2012	Spring	33:623:370:06	Management Information Systems	Undergrad Core	36	15	4.13	4.00
2011	--	22:711:573:76	Analytical Techniques	International EMBA	17	13	3.85	4.00
2011	--	22:711:573:77	Analytical Techniques	International EMBA	15	3	4.67	4.67
2011	Fall	16:711:558:01	Convex Analysis and Optimization	Graduate	5			
2011	Spring	33:623:370:03	Management Information Systems	Undergrad Core	36	16	4.19	4.25
2011	Spring	33:623:370:04	Management Information Systems	Undergrad Core	36	10	4.60	4.25
2010	--	22:711:573:76	Analytical Techniques	International EMBA				
2010	Spring	33:623:386:06	Operations Management	Undergrad Core	52	30	4.47	4.07
2009	--	22:711:573:76	Analytical Techniques	International EMBA	32	32	4.13	4.03
2009	Fall	33:623:386:01	Operations Management	Undergrad Core	51	31	4.67	4.41
2009	Spring	16:711:611:xx	Convex Analysis and Optimization (Special Topic)	Graduate	4			
2008	Fall	33:623:370:03	Management Information Systems	Undergrad Core	38	23	4.59	4.50
2008	Spring	ORFE 523	Nonlinear Optimization	Graduate (Princeton U.)	20	18		4.40
2007	--	22:711:573:76	Analytical Techniques	International EMBA				
2007	Spring	33:623:370:02	Management Information Systems	Undergrad Core	36	28	4.82	4.57
2007	Spring	33:623:370:03	Management Information Systems	Undergrad Core	36	25	4.68	4.36
2006	--	22:711:578:77	Operations Management	International EMBA	26	26	3.31	3.00
2006	Fall	33:623:370:05	Management Information Systems	Undergrad Core	40	24	4.59	4.14
2006	Fall	33:623:400:01	Advanced Operations Management	Undergraduate	15	12	4.75	4.50

Year	Term	Course Number	Course Name	Course Type	Enrolled	Respond	Teaching Effectiveness	Course Quality
2006	Spring	33:623:370:02	Management Information Systems	Undergrad Core	35	21	4.52	4.19
2006	Spring	33:623:370:03	Management Information Systems	Undergrad Core	35	34	4.21	3.76
2005	Fall	33:623:400:01	Advanced Operations Management	Undergraduate	11	11	4.73	4.64
2005	Spring	33:623:386:04	Operations Management	Undergrad Core	42	30	4.66	4.17
2005	Spring	33:623:386:05	Operations Management	Undergrad Core	30	20	4.75	4.45
2004	Fall	33:623:370:01	Management Information Systems	Undergrad Core	37	19	4.06	3.76
2004	Fall	33:623:370:02	Management Information Systems	Undergrad Core	36	30	4.03	3.70
2004	Spring	33:623:386:06	Operations Management	Undergrad Core	42	25	4.72	4.40
2004	Spring	33:623:386:08	Operations Management	Undergrad Core	45	27	4.59	4.37
2003	Fall	33:623:386:01	Operations Management	Undergrad Core	40	35	4.68	4.63
2003	Fall	33:623:386:02	Operations Management	Undergrad Core	38	17	4.47	4.18
2003	Spring	33:623:386:01	Operations Management	Undergrad Core	44	27	4.85	4.59
2003	Spring	33:623:386:02	Operations Management	Undergrad Core	44	40	4.75	4.51
2002	Fall	33:623:386:01	Operations Management	Undergrad Core	32	20	4.75	4.65
2002	Fall	33:623:386:02	Operations Management	Undergrad Core	27	27	4.73	4.72
2002	Spring	33:623:386:04	Operations Management	Undergrad Core	17	10	4.60	4.40
2002	Spring	33:623:386:05	Operations Management	Undergrad Core	44	38	4.78	4.54
2001	Fall	33:623:386:01	Operations Management	Undergrad Core	48	34	4.68	4.44
2001	Fall	33:623:386:02	Operations Management	Undergrad Core	50	50	4.67	4.52
2000	Spring	33:623:386:01	Operations Management	Undergrad Core	34	29	4.55	4.39
2000	Spring	33:623:386:02	Operations Management	Undergrad Core	33	30	4.69	4.32
1999	Fall	33:623:386:01	Operations Management	Undergrad Core	27	20	4.60	4.40
1999	Fall	33:623:386:02	Operations Management	Undergrad Core	32	30	4.50	4.23
1999	Spring	26:711:652:01	Nonlinear Programming	Graduate	12	11	4.45	4.45
1999	Spring	33:623:386:02	Operations Management	Undergrad Core	38	30	4.50	4.07
1998	Fall	33:623:386:01	Operations Management	Undergrad Core	37	30	4.69	4.38
1998	Fall	33:623:386:02	Operations Management	Undergrad Core	37	34	4.79	4.39
1998	Spring	26:198:685:02	Nonlinear Programming	Graduate	15	8	4.62	4.62
1998	Spring	33:623:386:03	Operations Management	Undergrad Core	40	34	4.48	4.15
1997	Fall	33:623:386:01	Operations Management	Undergrad Core	40	32	4.25	4.06
1997	Fall	33:623:386:02	Operations Management	Undergrad Core	38	34	4.64	4.12
1997	Spring	33:623:386:05	Operations Management	Undergrad Core	38	34	4.09	3.74
1996	Fall	33:623:386:02	Operations Management	Undergrad Core	29	25	4.36	4.29
1996	Spring	33:623:370:05	Management Information Systems	Undergrad Core	31	26	4.04	4.04

Year	Term	Course Number	Course Name	Course Type	Enrolled	Respond	Teaching Effectiveness	Course Quality
1996	Spring	33:623:370:03	Management Information Systems	Undergrad Core	33	27	3.85	3.68
1995	Fall	33:623:386:02	Management Information Systems	Undergrad Core	34	27	4.17	3.80

Open-Source Software

PEBBL (Parallel Enumeration and Branch-and-Bound Library): Co-designer and project leader. C++ library / framework for serial and parallel (using MPI) implementation of branch-and-bound algorithms. Developed in conjunction with Cynthia A. Phillips and William E. Hart of Sandia National Laboratories. The supporting UTILIB utility package to which I also contributed is now part of PEBBL. The PICO package for general mixed-integer programming was based on PEBBL, but is no longer supported. However, PEBBL is still actively and developed and supported. Available at <https://github.com/PEBBL/pebb1>.

YASAI (Yet Another Simulation Add-In): Designer and project leader. Visual Basic add-in for performing Monte-Carlo simulation in Excel. Primarily designed as a teaching tool meant to be easier to install and learn than commercial products. The State of Washington Department of Ecology developed a slightly enhanced version (YASAIw) which it uses for pollution analysis; nearly all YASAIw features have now been subsumed into YASAI. The software has also been used by the San Francisco Estuary Institute to model PCB pollution in San Francisco Bay. Developed in conjunction with numerous Rutgers Business School undergraduate students. Available at <http://www.yasai.rutgers.edu/>.

projSplitFit: Lead designer. A Python module facilitating experimentation with projective splitting algorithms for convex data fitting problems. Some design and most coding by Patrick R. Johnstone. Available at <https://github.com/1austrartsua1/projsplitFit>.

Professional Service and Miscellaneous

Journal Service:

- Editor-in-chief of *Mathematical Programming Computation*, January 2019-present. Instituted and maintained virtual-machine-based reviewing platform for technical evaluation of software accompanying submitted manuscripts.
- Member of editorial board of *Optimization Methods and Software*, August 2016-December 2018.
- Technical editor of *Mathematical Programming Computation*, January 2015-December 2018.
- Member of editorial board of *Computational Optimization and Applications*, April 1996-December 2018.
- Member of editor-in-chief review committee for *INFORMS Journal on Computing*, February-July 2015.
- Associate editor of *Mathematical Programming* (Series B), March 1995-September 2000.
- Associate editor for *Operations Research*, computing and decision technologies, January 1996-October 1999.

Conference Organization – Leading Roles

- Lead organizer for DIMACS/Simons workshop on ADMM and Proximal Splitting Methods, Piscataway, NJ, June 2018.

- Organizing committee member for INFORMS Optimization Society Meeting, Princeton, NJ, March 2016.
- One of four principle organizers of the DIMACS Workshop on COIN-OR (open-source software for Operations Research), Piscataway, NJ July 2006.

Conference Organization – Other

- Organized and chaired two sessions for INFORMS National Meeting (online), November 2020.
- Organized and chaired session for INFORMS National Meeting, Seattle, WA, October 2019.
- Organized and chaired session for ICCOPT 2019 (International Conference on Continuous Optimization 2019) Berlin, Germany, August 2019.
- Organized and chaired session for INFORMS Optimization Society Conference, Denver, CO, March 2018.
- Organized and chaired session for INFORMS Computing Society Conference, Austin, TX, January 2017.
- Organized and chaired session for INFORMS National Meeting, Nashville, TN, November 2016.
- Organized session for ICCOPT 2016 (International Conference on Continuous Optimization 2016) Tokyo, Japan, August 2016.
- Organized and chaired session for INFORMS National Meeting, Philadelphia, PA, November 2015.
- Organized and chaired session for International Symposium on Mathematical Programming (ISMP), Pittsburgh, PA, August 2015.
- Organized and chaired session for INFORMS Computing Society conference, Richmond, VA, January 2015.
- Organized and chaired sponsored session for INFORMS National Meeting, San Francisco, CA, November 2014.
- Organized and chaired session for INFORMS National Meeting, Charlotte, NC, November 2011.
- Organized and chaired session for INFORMS National Meeting, San Diego, CA, October 2009.
- Organized and chaired session for 20th International Symposium on Mathematical Programming, Chicago, IL, August 2009.
- Organized and chaired session in honor of Michael Rothkopf at INFORMS National Meeting, Washington, DC, October 2008.
- Member, site selection committee for 20th International Symposium on Mathematical Programming
- Organized session on computational integer programming for 19th International Symposium on Mathematical Programming, Rio de Janeiro, Brazil, July-August 2006. Chaired two sessions at this symposium.
- Organized two sessions for 18th International Symposium on Mathematical Programming, Lyngby, Denmark, August 2003.
- Organizing committee member for PAREO 2002, third meeting of the PAREO European working group on Parallel Processing in Operations Research, Guadeloupe, May 2002.
- Cluster chair for Parallel Computing, 17th International Mathematical Programming Symposium, Atlanta, GA (organized four sessions), August 2000.
- Organized session for INFORMS CSTS Conference, Monterey, CA, January 1998.

- Organized four sessions for 16th International Mathematical Programming Symposium, Lausanne, Switzerland (three co-organized with Martin Savelsbergh), August 1997.
- Program committee of SCOOP (Solving Combinatorial Optimization Problems in Parallel) conference (subset of the International Parallel Processing Symposium, IPPS '97), Geneva, Switzerland, April 1997.

Referee for:

- *Abstract and Applied Analysis*
- *Annals of Operations Research*
- *Applied Mathematics and Optimization*
- *Applied Mathematics Letters*
- *Applied Nonlinear Analysis*
- *Applied Numerical Mathematics*
- *Asian Pacific Journal of Operational Research*
- *Byte*
- *Central European Journal of Mathematics*
- *Computational Management Science*
- *Computational Optimization and Applications*
- *The Computer Journal*
- *Computers and Mathematics with Applications*
- *Computers and Operations Research*
- *Discrete Applied Mathematics*
- *ESAIM: Control, Optimization, and Calculus of Variations*
- *European Journal of Operational Research*
- *IEEE Transactions on Parallel and Distributed Systems*
- *IMA Journal on Numerical Analysis*
- *INFORMS/ORSA Journal on Computing*
- *INFORMS Journal on Optimization*
- *IISE Transactions*
- *Investigación Operativa*
- *Journal of Combinatorial Optimization*
- *Journal of Convex Analysis*
- *Journal of Global Optimization*
- *Journal of Mathematical Analysis and Applications*
- *Journal of Optimization Theory and Applications*
- *Journal of Parallel and Distributed Computing*
- *Management Science*
- *Mathematical Programming*
- *Mathematics of Computation*
- *Mathematics of Operations Research*
- *Nonlinear Analysis*
- *Numerical Algorithms*
- *Numerical Functional Analysis and Applications*
- *Numerical Linear Algebra with Applications*
- *Operations Research Letters*
- *Optimization*

- *Optimization and Engineering*
- *Optimization Methods and Software*
- *Parallel Computing*
- *Parallel Processing Letters*
- *Set Valued and Variational Analysis*
- *SIAM Journal on Control and Optimization*
- *SIAM Journal on Imaging Sciences*
- *SIAM Journal on Optimization*
- SIAM book acquisitions
- *Splitting methods in communication and imaging, science and engineering* (edited book)
- Numerous conference proceedings
- Various NSF proposals
- U.S. Civilian Research and Development Foundation (CRDF)
- Air Force Office of Scientific Research, both regular proposals and young investigators program (YIP)
- Israel Science Foundation

National Science Foundation

- NSF panel member, 2002, 2015, 2018

Professional Society Memberships:

- SIAM
- Mathematical Programming Society
- Fellow and member of INFORMS (formerly of full member of ORSA)
- Invited member of IFIP (International Federation of Information Processing) working group 7.8, “nonlinear optimization”.

Professional Society Service:

- Elected to INFORMS/ORSA Computer Science Technical Section (CSTS) board 1994-1996.
- Chair of 1995 INFORMS/CSTS prize committee.
- Member of 2001 INFORMS prize committee for best paper by a young researcher.
- Member of PAREO: Association of European Operational Research Societies working group on Parallel Processing in Operations Research.
- Chair of 2004 INFORMS Computing Society (ICS) prize committee.
- Full member of COIN-OR Foundation for open-source software in operations research, elected September 2006.
- Chair of 2007 INFORMS Computing Society (ICS) student paper award committee.
- INFORMS Computing Society (ICS) board, January 2008-December 2010.
- INFORMS Computing Society representative to INFORMS subdivision council, 2009 and 2010.
- *Ad hoc* committee for competition to stimulate development of methods for improved scheduling of large INFORMS conferences, 2009-2010.
- Member, award committee for Beale Orchard-Hayes prize for excellence in computation mathematical programming, 2021.

University Service

- Rutgers University committees:

- 2004-2005 President's undergraduate task force on undergraduate education, curriculum subcommittee.
- Rutgers Business School committees and positions:
 - New Brunswick Undergraduate Program Policy Committee, 2006-2007, 2012-2013 (co-chair), 2013-2014 (chair), 2015-2016 (co-chair), 2016-2017, 2017-2018 (co-chair), 2018-2019, 2020-2021.
 - 2019 Ad Hoc Salary Inequity Advisory Group
 - 2018 Ad Hoc Advisory Task Force on RBS Strategic Priorities.
 - Planning Committee, 2017-2020.
 - Ad hoc committee on large classes, 2012 (chair).
 - Appointments and Promotions Committee 2004-2005, 2016-2017.
 - Research Resources Committee 2008-2009 (dispensing small internal research grants, chair).
 - Courses of Study Committee 2009-2010 (chair), 2013-2014.
 - New Brunswick new building committee, July 2009-2012.
 - Undergraduate Core Curriculum Review Committee, October 2009-2010.
 - New Brunswick Academic Standing Committee, 1999-2011, 2013-2014.
 - Acting director of RUTCOR (Rutgers Center for Operations Research) July-December 2015.
 - Chair of Excel proficiency task force ad hoc committee, February 2016-2017.
- Departmental committees and positions:
 - Member of committee to update the BAIT curriculum, 2019-2021.
 - Non-tenure-track hiring committee, Spring 2021.
 - Coordinator of BAIT (Business Analytics and Information Technology) major for undergraduates on New Brunswick campus, 2011-2014.
 - Vice-chair of MSIS department, 2008-2011; led team to develop new BAIT major, effort beginning in 2010
 - Elected to departmental merit raise (FCP) committee, 2009, 2010
 - Chaired MSIS committee to overhaul undergraduate Management Science and Information Systems curriculum, New Brunswick campus, Rutgers University, 2005-2006. Developed various recruitment materials and presentations.
- Rutgers University, DIMACS:
 - Projects Committee, 2007-2009 (except when on sabbatical).

Miscellaneous

- Sufficient knowledge of French to comprehend technical papers
- Amateur jazz and Bossa Nova saxophonist and guitarist
- Regular fundraiser for Autism Speaks (formerly NAAR, the National Alliance for Autism Research), 2001-2012.

Computer Skills (Partial Listing)

Operating Systems: Linux and Unix (including some system administration experience), various versions of Microsoft Windows, MacOS, VSphere.

Languages: C++, C, Python, JavaScript, AMPL, Unix/Linux shell scripting, MATLAB, various dialects of FORTRAN, various dialects of BASIC including VBA, various dialects of LISP, and

assembly language for various processors. Additional experience with older languages such as Pascal and various SNOBOL dialects.

Applications/Miscellaneous: MPI. Standard Microsoft Office components plus Access, Visio, and FrontPage/Expressions Web. LaTeX and extensions, Sublime Text, EMACS. CPLEX, GuRubi, X, awk, FrameMaker.