

[Back to Henry B. Tippie College Directory Homepage](#)



Samuel A. Burer

Management Sciences

Professor

Henry B. Tippie Research Fellow

319-335-0931

samuel-burer@uiowa.edu

S346 John Pappajohn Bus Bldg

The University of Iowa, Iowa City, IA 52242-

1994

[Website](#)

[Google Scholar Profile page](#)

[Curriculum Vitae](#)

Academic History

- PhD in Algorithms, Combinatorics, and Optimization, Georgia Institute of Technology, 2001
- BS in Mathematics, University of Georgia, 1997

Expertise

- Mathematical optimization
- Operations research

Awards

- G.R.E.A.T. Faculty Award (First Year), Des Moines Executive MBA Class of 2012, April 2012
- Dean's Teaching Award in Management Sciences, Tippie College of Business, 2011
- Best Paper Award, Computational Optimization and Applications, 2009
- Martha and Dennis Hesse Research Fellow, 2004
- Honorable Mention, Young Researcher Competition, International Conference on Continuous Optimization, Mathematical Programming Society, August 2004
- New Hot Paper recognition by ISI Essential Science Indicators, 2003
- Delta Sigma Pi Outstanding Faculty Award, 2002
- INFORMS Optimization Prize for Young Researchers, 2002

Selected Publications

- Modifying Soyster's Model for the Symmetric Traveling Salesman Problem with Interval Travel Times, Nayoung Cho, Samuel A. Burer, Ann M. Campbell, Far East Journal of Applied Mathematics, vol 86, 2014,

- [The Trust Region Subproblem with Non-Intersecting Linear Constraints](#), Samuel A. Burer, Boshi Yang
- [A First-Order Smoothing Technique for a Class of Large-Scale Linear Programs](#), Samuel A. Burer, Jieqiu Chen
- [Second-Order-Cone Constraints for Extended Trust-Region Subproblems](#), Samuel A. Burer, Kurt M. Anstreicher, *SIAM Journal on Optimization*, vol 23, 2013, 432-451
- [A Two-Variable Analysis of the Two-Trust-Region Subproblem](#), Samuel A. Burer, Boshi Yang
- [Faster, but Weaker, Relaxations for Quadratically Constrained Quadratic Programs](#), Samuel A. Burer
- [Separation and relaxation for cones of quadratic forms](#), Samuel A. Burer, Hongbo Dong, *Mathematical Programming Series A*, vol 137, 2013, 343-370
- [Globally solving nonconvex quadratic programming problems via completely positive programming](#), Samuel A. Burer, Jieqiu Chen, *Mathematical Programming Computation*, vol 4, 2012, 33-52
- [Non-convex mixed-integer nonlinear programming: A survey](#), Samuel A. Burer, Adam Letchford, *Surveys in Operations Research and Management Science*, vol 17, 2012, 97-106
- [Unbounded convex sets for non-convex mixed-integer quadratic programming](#), Samuel A. Burer, Adam N. Letchford, *Mathematical Programming Series A*, 2012 - Publication Details Forthcoming
- [Representing quadratically constrained quadratic programs as generalized copositive programs](#), Samuel A. Burer, Hongbo Dong, *Operations Research Letters*, vol 40, 2012, 203-206
- [Robust rankings for college football](#), Samuel A. Burer, *Journal of Quantitative Analysis in Sports*, vol 8, 2012
- [Relaxing the Optimality Conditions of Box QP](#), Samuel A. Burer, Jieqiu Chen, *Computational Optimization and Applications*, vol 48, 2011, 653-673
- [A Semidefinite Approach to the Hypergraph Minimum Bisection Problem](#), Changhui Choi, Samuel A. Burer, *Optimization*, vol 60, 2011, 413-427
- [Computable Representations for Convex Hulls of Low-Dimensional Quadratic Forms](#), Kurt M. Anstreicher, Samuel A. Burer, *Mathematical Programming Series B*, vol 124, 2010, 33-43
- [Optimizing a Polyhedral-Semidefinite Relaxation of Completely Positive Programs](#), Samuel A. Burer, *Mathematical Programming Computation*, vol 2, 2010, 1-19
- [A p-Cone Sequential Relaxation Procedure for 0-1 Integer Programs](#), Samuel A. Burer, Jieqiu Chen, *Optimization Methods and Software*, vol 24, 2009, 523-548
- [On Non-Convex Quadratic Programming with Box Constraints](#), Samuel A. Burer, Adam N. Letchford, *SIAM Journal on Optimization*, vol 20, 2009, 1073-1089
- [On the Copositive Representation of Binary and Continuous Nonconvex Quadratic Programs](#), Samuel A. Burer, *Mathematical Programming Series A*, vol 120, 2009, 479-495
- [The Difference Between 5x5 Doubly Nonnegative and Completely Positive Matrices](#), Samuel A. Burer, Kurt M. Anstreicher, Mirjam Duer, *Linear Algebra and Its Applications*, vol 431, 2009, 1539-1552
- [A Finite Branch-and-Bound Algorithm for Nonconvex Quadratic Programming via Semidefinite Relaxations](#), Samuel A. Burer, Dieter Vandenbussche, *Mathematical Programming Series A*, vol 113, 2008, 259-282
- [Coordinating the Supply Chain in the Agricultural Seed Industry](#), Samuel A. Burer, Philip C. Jones, Timothy J. Lowe, *European Journal of Operational Research*, vol 185, 2008, 354-377
- [On Handling Free Variables in Interior-Point Methods for Conic Linear Optimization](#), Samuel A. Burer, Miguel Anjos, *SIAM Journal on Optimization*, vol 18, 2007, 1310-1325

- [Solving Maximum-Entropy Sampling Problems Using Factored Masks](#), Samuel A. Burer, Jon Lee, *Mathematical Programming*, vol 109, 2007, 263-281
- [Globally Solving Box-Constrained Nonconvex Quadratic Programs with Semidefinite-Based Finite Branch-and-Bound](#), Samuel A. Burer, Dieter Vandembussche, *Computational Optimization and Applications*, vol 43, 2007, 181-195
- [Computational Enhancements in Low-Rank Semidefinite Programming](#), Samuel A. Burer, Changhui Choi, *Optimization Methods and Software*, vol 21, 2006, 493-512
- [Ensemble Pruning via Semi-definite Programming](#), Samuel A. Burer, Yi Zhang, Nick Street, *Journal of Machine Learning Research*, vol 7, 2006, 1315-1338
- [Solving Lift-and-Project Relaxations of Binary Integer Programs](#), Samuel A. Burer, Dieter Vandembussche, *SIAM Journal on Optimization*, vol 16, 2006, 726-750
- [D.C. Versus Copositive Bounds for Standard OP](#), Kurt M. Anstreicher, Samuel A. Burer, *Journal Of Global Optimization*, vol 33, 2005, 299-312
- [Local Minima and Convergence in Low-Rank Semidefinite Programming](#), Samuel A. Burer, Renato D. C. Monteiro, *Mathematical Programming Series A*, vol 103, 2005, 427-444
- [A Computational Study of a Gradient-Based Log-Barrier Algorithm for a Class of Large-Scale SDPs](#), Samuel A. Burer, Renato D. C. Monteiro, Yin Zhang, *Mathematical Programming Series B*, vol 95, 2003, 359-379
- [A General Framework for Establishing Polynomial Convergence of Long-Step Methods for Semidefinite Programming](#), Samuel A. Burer, Renato D. C. Monteiro, *Optimization Methods and Software*, vol 18, 2003, 1-38
- [A Nonlinear Programming Algorithm for Solving Semidefinite Programs via Low-Rank Factorization](#), Samuel A. Burer, Renato D. C. Monteiro, *Mathematical Programming Series B*, vol 95, 2003, 329-357
- [Semidefinite Programming in the Space of Partial Positive Semidefinite Matrices](#), Samuel A. Burer, *SIAM Journal on Optimization*, vol 14, 2003, 139-172
- [Interior Point Algorithms for Semidefinite Programming Based on a Nonlinear Formulation](#), Samuel A. Burer, Renato D. C. Monteiro, Yin Zhang, *Computational Optimization and Applications*, vol 22, 2002, 49-79
- [Maximum Stable Set Formulations and Heuristics Based on Continuous Optimization](#), Samuel A. Burer, Renato D. C. Monteiro, Yin Zhang, *Mathematical Programming Series A*, vol 94, 2002, 137-166
- [Solving a Class of Semidefinite Programs via Nonlinear Programming](#), Samuel A. Burer, Renato D. C. Monteiro, Yin Zhang, *Mathematical Programming Series A*, vol 93, 2002, 97-122
- [A Projected Gradient Algorithm for Solving the Maxcut SDP Relaxation](#), Samuel A. Burer, Renato D. C. Monteiro, *Optimization Methods and Software*, vol 15, 2001, 175-200
- [Rank-Two Relaxation Heuristics for Max-Cut and Other Binary Quadratic Programs](#), Samuel A. Burer, Renato D. C. Monteiro, Yin Zhang, *SIAM Journal on Optimization*, vol 12, 2001, 503-521

Working Papers

- [Convex Optimization of Centralized Inventory Operations](#), Samuel A. Burer, Moshe Dror

Conference Proceedings

- [Sharing Classifiers among Ensembles from Related Problem Domains](#), Samuel A. Burer, Yi Zhang, Nick

Sponsored Research

- CAREER: Computation, Theory, and Applications for Nonconvex Quadratic and Conic Optimization, Samuel A. Burer. National Science Foundation
- Collaborative Research: Theory and Applications for Nonconvex Quadratic and Conic Optimization, Samuel A. Burer. National Science Foundation

Other Work

- [The MILP Road to MIOCP, Samuel A. Burer, Anureet Saxena, IMA Volumes in Mathematics and Its Applications, vol 154, 2011, 373-406](#)

Work In Progress

- An Algorithm for Computing the CP-Factorization of a Completely Positive Matrix, Kurt M. Anstreicher, Samuel A. Burer, Peter J.C. Dickinson

Current & Prior Positions

- Professor, Department of Management Sciences, Henry B. Tippie College of Business, The University of Iowa, August 2012 - Present
- Associate Professor, Department of Management Sciences, Henry B. Tippie College of Business, The University of Iowa, August 2007 - July 2012
- Assistant Professor, Department of Management Sciences, Henry B. Tippie College of Business, The University of Iowa, August 2001 - July 2007
- Visiting Assistant Professor, Operations Research Group, Carnegie Mellon University, January 2007 - May 2007
- Research Intern, Wolfram Research, June 1997 - October 1997

Review and Editorial Work

- Referee, Annals of Operations Research
- Referee, ANZIAM Journal
- Referee, Automatica
- Referee, Discrete Applied Mathematics
- Referee, Discrete Optimization
- Referee, European Journal of Operational Research
- Referee, INFORMS Journal on Computing
- Referee, Journal of Global Optimization

- Referee, Journal of Graphical and Computational Statistics
- Referee, Journal of Heuristics
- Referee, Journal of Machine Learning Research
- Referee, Journal of Mathematical Analysis and Applications
- Referee, Mathematical Programming
- Referee, Mathematics of Operations Research
- Referee, Optimization and Engineering
- Referee, Optimization Letters
- Referee, Optimization Methods and Software
- Referee, SIAM Journal on Optimization

Professional Affiliations

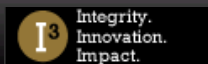
- Associate Editor, Mathematics of Operations Research, 2011 - current
- Associate Editor, SIAM Journal on Optimization, 2011 - current
- Associate Editor, Mathematical Programming Computation, 2008 - 2013
- Associate Editor, Asia-Pacific Journal of Operational Research, 2007 - 2010

Presentations

- Optimizing a Polyhedral-Semidefinite Relaxation of Completely Positive Programs, Universita di Firenze, Universita di Firenze, Florence, Italy, May 2009

Committees and Professional Service

- INFORMS Computing Society, 2014-2017
- Mathematical Optimization Society, 2012-2015



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