

# Oleg A. Prokopyev

## CURRICULUM VITAE

DEPARTMENT OF INDUSTRIAL ENGINEERING  
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### Education

- ◇ **Ph.D. in Industrial and Systems Engineering**, 2006  
Department of Industrial and Systems Engineering, University of Florida  
Dissertation Advisor: Dr. Panos M. Pardalos
- ◇ **Master of Science in Industrial and Systems Engineering**, 2005  
Department of Industrial and Systems Engineering, University of Florida
- ◇ **Master of Science in Applied Mathematics and Physics**, 2002  
*Honor of Excellence Diploma*  
Moscow Institute of Physics and Technology (MIPT), Moscow, Russia
- ◇ **Bachelor of Science in Applied Mathematics and Physics**, 2000  
*Honor of Excellence Diploma*  
Moscow Institute of Physics and Technology (MIPT), Moscow, Russia

### Appointments

- ◇ September 2006 - present, Assistant Professor, Department of Industrial Engineering, University of Pittsburgh
- ◇ January 2002 - August 2006, Graduate Research/Teaching Assistant, Department of Industrial and Systems Engineering, University of Florida

### Awards

- ◇ 2004, The William Pierskalla best paper award for research excellence in health care management science, Institute for Operations Research and the Management Sciences (INFORMS).
- ◇ 2004 and 2005, Graduate Student Awards for Excellence in Research, Department of Industrial and Systems Engineering, University of Florida.

### Publications

#### Refereed Journal Articles

1. A. Trapp, O.A. Prokopyev, "Solving Order-Preserving Submatrix Problem via Integer Programming," *INFORMS Journal on Computing*, accepted for publication, 2009.
2. M. Baz, B. Hunsaker, O.A. Prokopyev, "How Much Do We 'Pay' for Using Default Parameters?," *Computational Optimization and Applications*, accepted for publication, 2009.
3. A. Trapp, O.A. Prokopyev, S. Busygin, "Finding Checkerboard Pattern via Fractional 0-1 Programming," *Journal of Combinatorial Optimization*, accepted for publication, 2009.
4. O.A. Prokopyev, "On Equivalent Reformulations for Absolute Value Equations," *Computational Optimization and Applications*, accepted for publication, 2009.

5. O.A. Prokopyev, S. Butenko, A. Trapp, "Checking Solvability of Systems of Interval Linear Equations and Inequalities via Mixed Integer Programming," *European Journal of Operational Research*, Vol. 199 (2009), pp. 117-121.
6. J. Rajgopal, Z. Wang, A. Schaefer, O.A. Prokopyev, "Effective Management Policies for Remnant Inventory Supply Chains," *IIE Transactions*, Vol. 41 (2009), pp. 437-447.
7. O.A. Prokopyev, N. Kong, D.L. Martinez-Torres, "The Equitable Dispersion Problem," *European Journal of Operational Research*, Vol. 197 (2009), pp. 59-67.
8. O. Seref, O.E. Kundakcioglu, O.A. Prokopyev, P.M. Pardalos, "Selective Support Vector Machines," *Journal of Combinatorial Optimization*, Vol. 17 (2009), pp. 3-20.
9. O. Shylo, O.A. Prokopyev, V. Shylo, "Solving Weighted MAX-SAT via GES," *Operations Research Letters*, Vol. 36 (2008), pp. 434-438.
10. S. Busygin, O.A. Prokopyev, P.M. Pardalos, "Biclustering in Data Mining," *Computers & Operations Research*, Vol. 35/9 (2008), pp. 2964-2987.
11. P. Pardalos, O.A. Prokopyev, O. Shylo, V. Shylo, "Global Equilibrium Search Applied to the Unconstrained Binary Quadratic Optimization Problem," *Optimization Methods and Software*, Vol. 23/1 (2008), pp. 129-140.
12. C.A.S. Oliveira, O.A. Prokopyev, P.M. Pardalos, M.G.C. Resende, "Streaming Cache Placement Problems: Complexity and Algorithms," *International Journal of Computational Science and Engineering*, Vol. 3 (2007), pp. 173-183.
13. S. Busygin, O.A. Prokopyev, P.M. Pardalos, "An Optimization Based Approach for Data Classification," *Optimization Methods and Software*, Vol. 22/1 (2007), pp. 3-9.
14. W. Chaovalitwongse, O.A. Prokopyev, P.M. Pardalos, "Electroencephalogram (EEG) Time Series Classification: Applications in Epilepsy," *Annals of Operations Research*, Vol. 148 (2006), pp. 227-250.
15. M. Min, O.A. Prokopyev, P.M. Pardalos, "Optimal Solutions to Minimum Total Energy Broadcasting Problem in Wireless Ad Hoc Networks," *Journal of Combinatorial Optimization*, Vol. 11/1 (2006), pp. 59-69.
16. H.-Z. Huang, P. Pardalos, O.A. Prokopyev, "Lower Bound Improvement and Forcing Rule for Quadratic Binary Programming," *Computational Optimization and Applications*, Vol. 33 (2006), pp. 187-208.
17. S. Busygin, O.A. Prokopyev, P.M. Pardalos, "Feature Selection for Consistent Biclustering via Fractional 0-1 Programming," *Journal of Combinatorial Optimization*, Vol. 10/1 (2005), pp. 7-21.
18. O.A. Prokopyev, C. Meneses, C.A.S. Oliveira, P.M. Pardalos, "On Multiple-Ratio Hyperbolic 0-1 Programming Problems," *Pacific Journal of Optimization*, Vol. 1/2 (2005), pp. 327-345.
19. O.A. Prokopyev, H.-Z. Huang, P.M. Pardalos, "On Complexity of Unconstrained Hyperbolic 0-1 Programming Problems," *Operations Research Letters*, Vol. 33/3 (2005), pp. 312-318.
20. H. K. Fung, S. Rao, C. A. Floudas, O.A. Prokopyev, P.M. Pardalos, F. Rendl, "Computational Comparison Studies of Quadratic Assignment Like Formulations for the In Silico Sequence Selection Problem in De Novo Protein Design," *Journal of Combinatorial Optimization*, Vol. 10/1 (2005), pp. 41-60.
21. P.M. Pardalos, W. Chaovalitwongse, L.D. Iasemidis, J.C. Sackellares, D.-S. Shiau, P.R. Carney, O.A. Prokopyev, V.A. Yatsenko, "Seizure Warning Algorithm Based on Optimization and Nonlinear Dynamics," *Mathematical Programming*, Vol. 101/2 (2004), pp. 365-385.
22. W. Chaovalitwongse, P.M. Pardalos, O.A. Prokopyev, "A New Linearization Technique for Multi-Quadratic 0-1 Programming Problems," *Operations Research Letters*, Vol. 32/6 (2004), pp. 517-522.

23. O.A. Prokopyev, P.M. Pardalos, "On Approximability of Boolean Formula Minimization," *Journal of Combinatorial Optimization*, Vol. 8/2 (2004), pp. 129–135.
24. O.A. Prokopyev, P.M. Pardalos, "Minimum  $\epsilon$ -equivalent Circuit Size Problem," *Journal of Combinatorial Optimization*, Vol. 8/4 (2004), pp. 495–502.

#### Refereed Book Chapters

1. O.A. Prokopyev, "Fractional Zero-One Programming," in *Encyclopedia of Optimization* (C. Floudas et al., eds.), Springer (2009), pp. 1091–1094.
2. C. Ihrig, M. Baz, J. Stander, R. R. Hoare, B. A. Norman, O. Prokopyev, B. Hunsaker, and A. K. Jones, "Greedy Algorithms for Mapping onto a Coarse-grained Reconfigurable Fabric," in *Advances in Greedy Algorithms*, (W. Bednorz, ed.), In-Tech (2008), pp. 193–222.
3. P. Velagapudi, O. Prokopyev, P. Scerri, K. Sycara, "A Token-Based Approach to Sharing Beliefs in a Large Multiagent Team," in *Optimization and Cooperative Control Strategies* (M.J. Hirsch et al., eds.), Lecture Notes in Control and Information Sciences, Springer (2008), pp. 417–429.
4. O. A. Prokopyev, V. Boginski, W. Chaovalitwongse, P.M. Pardalos, J.C. Sackellares, P.R. Carney, "Network-based Techniques in EEG Data Analysis and Epileptic Brain Modeling," in *Data Mining in Biomedicine* (P.M. Pardalos et al., eds.), Springer (2007), pp. 559–574.
5. W. Chaovalitwongse, L.D. Iasemidis, P.R. Carney, J.C. Sackellares, D.-S. Shiau, L.K. Dance, O. A. Prokopyev, V. Boginski, P.M. Pardalos, "Data Mining in EEG: Application to Epileptic Brain Disorders," in *Data Mining in Biomedicine* (P.M. Pardalos et al., eds.), Springer (2007), pp. 459–482.
6. V. Yatsenko, P. Pardalos, O.A. Prokopyev, S. Nair, "Control of Symmetry by Lyapunov Exponents," *NaUKMA Scientific Notes*, Physical-Mathematical Sciences, Kyiv-Mohyla University (Kyiv, Ukraine), Vol. 51 (2006), pp. 11–18.
7. P.M. Pardalos, O.A. Prokopyev, S. Busygin, "Continuous Approaches for Solving Discrete Optimization Problems," in *Handbook on Modelling for Discrete Optimization* (G. Appa et al., eds.), pp. 39–60, Springer, 2006.
8. P.M. Pardalos, V.L. Boginski, O.A. Prokopyev, W. Suharitdamrong, P.R. Carney, W. Chaovalitwongse, A. Vazacopoulos, "Optimization Techniques in Medicine," in *Essays and Surveys in Global Optimization* (C. Audet et al., eds.), Springer, pp. 211–232, 2005.
9. V. Boginski, S. Butenko, P. M. Pardalos, O. Prokopyev, "Collaboration Networks in Sports," in *Economics, Management and Optimization in Sports* (S. Butenko et al., eds.), Springer, pp. 265–277, 2004.

#### Refereed Conference Proceedings

1. P. Velagapudi, O.A. Prokopyev, K. Sycara, P. Scerri, "Analyzing the Performance of Randomized Information Sharing," Proceedings of the *8th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2009)*, pp. 821–828.
2. S. Wu, L. Shuman, B. Bidanda, O. Prokopyev, M. Kelley, K. Sochats, C. Balaban, "Simulation-based decision support system for real-time disaster response management," Proceedings of the *2008 Industrial Engineering Research Conference*, J. Fowler and S. Mason (eds.), pp. 58–63.
3. P. Velagapudi, O.A. Prokopyev, K. Sycara, P. Scerri, "Maintaining Shared Belief in a Large Multiagent Team," Proceedings of the *10th International Conference on Information Fusion*, 2007, pp. 1–8.
4. P.M. Pardalos, O.A. Prokopyev, S. Busygin, "On Biclustering with Feature Selection for Microarray Data Sets," *BIOMAT 2005 – International Symposium on Mathematical and Computational Biology*, R. Mondaini (ed.), World Scientific (2006), pp. 367–378.
5. V. Yatsenko, J.C. Sackellares, P.M. Pardalos, P. Carney, O.A. Prokopyev, "Geometric Models, Fiber Bundles and Biomedical Applications," Proceedings of *International Conference Symmetry in Nonlinear Mathematical Physics*, Vol. 3 (2004), pp. 1518–1525.

### Articles Submitted to Refereed Journals

1. N. Alpay, A. Trapp, O.A. Prokopyev, C. Camacho, "Optimization of Minimum Set of Protein-DNA Interactions: a Quasi Exact Solution with no Overfitting," submitted, 2009.
2. O. Ozaltin, O.A. Prokopyev, A.J. Schaefer, "Two-Stage Quadratic Integer Programs with Stochastic Right-Hand Sides," submitted, 2009.
3. S. Rebennack, O.A. Prokopyev, P.M. Pardalos, "On the Two-Stage Stochastic Minimum  $s - t$  Cut Problem," submitted, 2009.
4. S. Butenko, O.A. Prokopyev, "On  $k$ -club and  $k$ -clique Numbers in Graphs," under revision, 2009.
5. J. Rajgopal, Z. Wang, A. Schaefer, O.A. Prokopyev, "Integrated Design and Operation of Remnant Inventory Supply Chains under Uncertainty," under revision, 2009.

### Working Papers

1. O. Ursulenko, O.A. Prokopyev, S. Butenko, "Exact Approaches for Solving the Minimum Ratio Spanning Tree Problem with Multiple-Ratios."
2. O. Ozaltin, A.J. Schaefer, O.A. Prokopyev, M.S. Roberts, "Optimizing Annual Influenza Vaccine Strain Selection."
3. A. Trapp, O.A. Prokopyev, A. Schaefer, "On Global Optimization of Two-Stage Stochastic Integer Programs with Partial Value Functions."
4. A. Trapp, F. Zink, O. Prokopyev, L. Schaefer, "Thermoacoustic Heat Engine Modeling and Optimization."

### Non-refereed Publications

1. W. Chaovalitwongse, O.A. Prokopyev, P.M. Pardalos, "Optimization Approaches to Characterize the Hidden Dynamics of the Epileptic Brain: Seizure Prediction and Localization," *SIAG/OPT Views-and-News* (the newsletter for the SIAM Activity Group on Optimization), Vol. 17/2 (2006), pp. 9–19.

### Book Reviews

1. Yaroslav D. Sergeyev (2003), *Arithmetic of infinity*, Edizioni Orizzonti Meridionali, 112 pp., ISBN 88-89064-01-3. Review published in *Optimization Methods and Software*, Vol. 21 (2006), pp. 995-996.

### Edited Books and Special Issues of Journals

1. D. Grundel, R. Murphey, P. Pardalos, O.A. Prokopyev (Editors), "Cooperative Networks: Control and Optimization," Series: New Dimensions in Networks, Edward Elgar Publishing, 2008.
2. Special Issue of *Journal of Global Optimization* dedicated to *International Workshop on Multilevel Optimization: Algorithms and Applications* (A. Karakitsiou and O.A. Prokopyev, Guest Editors), Volume 38, Number 4, 2007.
3. Special Issue on *System Approaches, Optimization and Data Mining in Biomedicine* of *Journal Optimization Methods and Software* (C. Floudas and O.A. Prokopyev, Guest Editors), Volume 22, Number 1, 2007.
4. D. Grundel, R. Murphey, P. Pardalos, O.A. Prokopyev (Editors), "Cooperative Systems: Control and Optimization," Series: Lecture Notes in Economics and Mathematical Systems, Vol. 588, Springer, 2007.
5. W.W. Hager, S.-J. Huang, P.M. Pardalos, O.A. Prokopyev (Editors), "Multiscale Optimization Methods and Applications," Series: Nonconvex Optimization and Its Applications, Vol. 82, Springer, 2006.

## Funded Research Proposals

### Peer-reviewed Grants

- ◇ **O.A. Prokopyev** (PI), *Collaborative Research: International Experience for Students: U.S.-Ukraine Collaboration on Discrete and Nondifferentiable Optimization*, National Science Foundation Grant OISE-0853997, \$64,530, June 2009-May 2012.
- ◇ S. Butenko (PI, Texas A&M University), V. Boginski (co-PI, University of Florida), and **O.A. Prokopyev** (co-PI), *Optimization Techniques for Clustering, Connectivity, and Flow Problems in Complex Networks*, Air Force Office of Scientific Research, \$349,952 (Pitt portion \$27,000), September 2008-August 2011.
- ◇ A.J. Schaefer (PI), **O.A. Prokopyev** (co-PI), M. Roberts (co-PI), B. Lee (co-PI) and D. Burke (co-PI), *Optimizing Flu Shot Design under Uncertainty*, National Science Foundation Grant CMMI-0826141, \$326,826, September 2008-August 2011.
- ◇ **O.A. Prokopyev** (PI), *Novel Optimization-Based Biclustering Algorithms for Biomedical Data Analysis*, National Science Foundation Grant CMMI-0825993, \$212,789, September 2008-August 2011.
- ◇ **O.A. Prokopyev** (PI), N. Kong (co-PI, Purdue University), *Stochastic Pseudo-Boolean Optimization*, Air Force Office of Scientific Research, \$345,144 (Pitt portion \$195,144), May 2008-April 2011.

### Non-Peer Reviewed Grants

- ◇ **O.A. Prokopyev** (PI), *Stochastic Quadratic Zero-One Programming*, University of Pittsburgh Central Research Development Fund, \$16,000, July 2008 - June 2010.

## Professional Activities

### Refereed Journals:

- ◇ Editorial Board Member, *Journal of Global Optimization* (Springer).
- ◇ Editorial Board Member, *Optimization Letters* (Springer).

### Conferences:

- ◇ Program Committee Member, *3rd Annual International Conference on Combinatorial Optimization and Applications (COCO'09)*, Yellow Mountains, China, June 10-12, 2009.
- ◇ Advisory Committee Member, *Yalta Conference on Discrete and Global Optimization*, in honor of the 50th anniversary of the founding of Glushkov Institute of Cybernetics, Yalta, Ukraine, July 31-August 2, 2008.
- ◇ Co-organizer, *Conference on Data Mining, Systems Analysis and Optimization in Biomedicine*, University of Florida, Gainesville, FL, March 28-30, 2007.
- ◇ Organizing Committee Member, *INFORMS Annual Meeting*, Pittsburgh, PA, November 5-8, 2006.
- ◇ Co-organizer, *6th Conference on Cooperative Control and Optimization*, University of Florida, Gainesville, FL, February 1-3, 2006.
- ◇ Chair of the invited sessions on *Global Optimization and Applications*, INFORMS Annual Meeting, November 13-16 2005, San Francisco, CA.
- ◇ Co-organizer, *5th Conference on Cooperative Control and Optimization*, University of Florida, Gainesville, FL, January 20-22, 2005.

- ◇ Refereed articles for *Journal of Global Optimization*, *Computational Optimization and Applications*, *Optimization Methods and Software*, *Journal of Combinatorial Optimization*, *International Journal of Computational Science and Engineering*, *Optimization Letters*, *Algorithmic Operations Research*, *Networks*, *Computers & Operations Research*, *Computers in Biology and Medicine*, *European Journal of Operational Research*.
- ◇ NSF panelist, December 2007.

## Contributions to Teaching

### University of Pittsburgh

- ◇ IE 3078, Convex Optimization, Spring 2009
- ◇ IE 2082, Linear Optimization, Fall 2008 and Fall 2009
- ◇ IE 3053, Global Optimization, Spring 2008
- ◇ IE 3097, Algorithms for Engineers, Fall 2007
- ◇ IE 3087, Network-based Optimization, Spring 2006
- ◇ IE 0015, Introduction to Information Systems Engineering, Fall 2006 and Fall 2007

### University of Florida

- ◇ ESI4312, Operations Research I, Spring 2006
- ◇ ESI4567C, Matrix and Numerical Methods in Systems Engineering, Summer and Fall 2005

## Graduate Students

### PhD Students Supervised

- ◇ Andrew Trapp, in progress.
- ◇ Serdar Karademir, in progress.
- ◇ Osman Ozaltin (co-advising with Andrew Schaefer), in progress.
- ◇ Behdad Beheshti, in progress.

### Doctoral Committees

- ◇ Oleksii Ursulenko, *Exact Approaches in Fractional Combinatorial Optimization*, Department of Industrial Engineering, Texas A&M University. Graduated September, 2009.
- ◇ Mustafa Baz, *Mixed Integer Linear Programs and a Partial Sliding MILP Heuristic for Mapping onto a Flexible Low-Power Electronic Fabric Architecture*, Department of Industrial Engineering, University of Pittsburgh. Graduated August, 2008.
- ◇ Shane Wu, *Agent-Based Discrete Event Simulation Modeling and Real-Time Evolutionary Decision Making for Large-Scale Systems*, Department of Industrial Engineering, University of Pittsburgh, Graduated December, 2008.