

# Jason J. Sauppe

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## Education

**Ph.D. Computer Science**, August 2015 GPA 3.9/4.0

University of Illinois at Urbana-Champaign, Urbana, IL

- *Dissertation*: Balance Optimization Subset Selection: A Framework for Causal Inference with Observational Data
- *Advisor*: Dr. Sheldon H. Jacobson

**B.S. Computer Science and Mathematics**, May 2009 GPA 4.0/4.0

Rose-Hulman Institute of Technology, Terre Haute, IN

- *Senior Thesis*: A Tabu Search Algorithm for the Bandwidth Multicoloring Problem
- *Advisor*: Dr. David J. Rader

## Publications

### Journal Papers

1. Rigdon, S. E., J. J. Sauppe, S. H. Jacobson. 2015. Forecasting the 2012 and 2014 elections using Bayesian prediction and optimization. *SAGE Open* **5**(2) 1–16.
2. Sauppe, J. J., S. H. Jacobson, E. C. Sewell. 2014. Complexity and approximation results for the Balance Optimization Subset Selection model for causal inference in observational studies. *INFORMS J. Comput.* **26**(3) 547–566.
3. Morrison, D. R., J. J. Sauppe, E. C. Sewell, S. H. Jacobson. 2014. A wide branching strategy for the graph coloring problem. *INFORMS J. Comput.* **26**(4) 704–717.
4. Nikolaev, A. G., S. H. Jacobson, W. K. T. Cho, J. J. Sauppe, E. C. Sewell. 2013. Balance Optimization Subset Selection (BOSS): An alternative approach for causal inference with observational data. *Oper. Res.* **61**(2) 398–412.
5. Cho, W. K. T., J. J. Sauppe, A. G. Nikolaev, S. H. Jacobson, E. C. Sewell. 2013. An optimization approach for making causal inferences. *Statistica Neerlandica* **67**(2) 211–226.
6. Morrison, D. R., J. J. Sauppe, S. H. Jacobson. 2013b. A network simplex algorithm for the equal flow problem on a generalized network. *INFORMS J. Comput.* **25**(1) 2–12.
7. Morrison, D. R., J. J. Sauppe, S. H. Jacobson. 2013a. An algorithm to solve the proportional network flow problem. *Optim. Lett.* **8**(3) 801–809.
8. Sewell, E. C., J. J. Sauppe, D. R. Morrison, S. H. Jacobson, G. K. Kao. 2012. A BB&R algorithm for minimizing total tardiness on a single machine with sequence dependent setup times. *J. Global Optim.* **54**(4) 791–812.

9. Carbo, L., K. Kragh, J. Krotz, A. Meiers, N. Shaffer, S. Torno, J. Sauppe, R. Ditteon. 2009. Asteroid lightcurve analysis at the Oakley Southern Sky Observatory and Oakley Observatory: 2008 September and October. *Minor Planet Bull.* **36**(3) 91–94.
10. Shipley, H., A. Dillard, J. Kendal, M. Reichert, J. Sauppe, N. Shaffer, T. Kleeman, R. Ditteon. 2008. Asteroid lightcurve analysis at the Oakley Observatory - September 2007. *Minor Planet Bull.* **35**(3) 99–102.
11. Sauppe, J., S. Torno, R. Lemke-Oliver, R. Ditteon. 2007. Asteroid lightcurve analysis at the Oakley Observatory - March/April 2007. *Minor Planet Bull.* **34**(4) 119–122.

### **Manuscripts Under Review**

1. Sauppe, J. J., S. H. Jacobson. 2015. The role of covariate balance in observational studies (Under revision).
2. Sauppe, J. J., D. R. Morrison, S. H. Jacobson. 2015b. Panel scheduling at the National Science Foundation (Under revision).
3. Morrison, D. R., S. H. Jacobson, J. J. Sauppe, E. C. Sewell. 2015a. Branch-and-bound algorithms: A survey of recent advances in searching, branching, and pruning (Under revision).

### **Unpublished Manuscripts and Working Papers**

1. Sauppe, J. J., S. H. Jacobson, E. C. Sewell. 2015a. A computational study of the Balance Optimization Subset Selection (BOSS) model (Working paper).
2. Morrison, D. R., J. J. Sauppe, E. C. Sewell, S. H. Jacobson. 2015b. Cyclic Best First Search: Using contours to guide branch-and-bound algorithms (Working paper).

### **Conference Presentations**

1. “Testing Assumptions for Causal Inference with Observational Data using the BOSS Model,” INFORMS Computing Society Conference, Richmond, VA, January 13, 2015.
2. “The Role of Optimization and Covariate Balance in Observational Studies,” INFORMS Annual Meeting, San Francisco, CA, November 11, 2014.
3. “Improving the Reliability of Treatment Effect Estimates using the BOSS Model,” INFORMS Annual Meeting, Minneapolis, MN, October 7, 2013.
4. “The Balance Optimization Subset Selection (BOSS) Model for Causal Inference,” INFORMS Computing Society Conference, Santa Fe, NM, January 6, 2013.
5. “The Balance Optimization Subset Selection (BOSS) Model for Causal Inference,” INFORMS Annual Meeting, Phoenix, AZ, October 6, 2012.
6. “A tabu search algorithm for the bandwidth multicoloring problem,” Indiana MAA Section Meeting, IUPUI, March 21, 2009. Also presented at Rose-Hulman Institute of Technology Undergraduate Mathematics Conference, March 27, 2009.

## Campus Talks and Panels

1. “Life in Graduate School,” panelist, UIUC Career Center, Champaign, IL, October 28, 2014.
2. “What to Expect from and How to Apply to Graduate School,” Rose-Hulman Undergraduate Conference on Mathematics, Terre Haute, IN, April 12, 2014; April 20, 2013.
3. “Election Analytics: Forecasting the Outcomes of the 2012 United States Federal Elections,” UIUC Math Club meeting, Urbana, IL, October 30, 2012.
4. “Balanced Matching: A Generalized Approach for Causal Inference,” RHIT Math Colloquium, Terre Haute, IN, October 19, 2011.

## Honors and Awards

- “Top 5 Papers Published in JOGO in 2012” for Sewell et al. (2012), 2013
- Best Graduate Research Project, UIUC CS Spring Research Symposium, 2013
- Best Team Research Presentation (with David Morrison), UIUC CS Grad Expo, 2011
- National Defense Science and Engineering Graduate Fellowship, 2010
- National Science Foundation Graduate Student Research Fellowship, 2010
- Saburo Muroga Endowed Fellowship Award, UIUC Computer Science Department, 2009
- Addison-Wesley Outstanding Senior Award, RHIT Computer Science Department, 2009
- Michael Atkins Outstanding Senior Thesis Award, RHIT Computer Science Department, 2009
- Clarence P. Sousley Award for Best Senior Thesis, RHIT Mathematics Department, 2009
- Heminway, Bogart, Wischmeyer, and Heminway Gold Scholar Awards, RHIT, 2006 - 2009

## Professional Experience

**Assistant Professor** in the Computer Science Department 08/2015 - Present  
University of Wisconsin–La Crosse, La Crosse, WI  
– Teach *Software Design I* and *Discrete Computational Structures*

**Advisor** for Election Analytics Project 01/2012 - Present  
University of Illinois at Urbana-Champaign, Urbana, IL  
– Lead a team of undergraduates in updating and managing the [Election Analytics](#) website

**Graduate Work** with Dr. Sheldon H. Jacobson 08/2009 - 08/2015  
University of Illinois at Urbana-Champaign, Urbana, IL  
– Apply optimization techniques to model and solve a fundamental problem in causal inference  
– Improve performance of branch-and-bound algorithms using new search strategies

**Teaching Assistant** for Computer Science Department 08/2014 - 12/2014  
University of Illinois at Urbana-Champaign, Urbana, IL  
– Course: Stochastic Processes and Applications

**Mentor** for Passionate on Parallel REU 06/2012 - 08/2012  
University of Illinois at Urbana-Champaign, Urbana, IL

- Advised two undergraduates in their work to parallelize research code

**Student Assistant** for Computer Science Department 11/2005 - 05/2009  
Rose-Hulman Institute of Technology, Terre Haute, IN

- Implemented and managed automatic grading system for student code
- Teaching assistant for: Object-Oriented Software Development, Data Structures and Algorithm Analysis, Programming Language Concepts, Fractals and Chaotic Dynamical Systems, Design and Analysis of Algorithms

**Senior Thesis** with Dr. David J. Rader 08/2008 - 05/2009  
Rose-Hulman Institute of Technology, Terre Haute, IN

- Developed a tabu search algorithm for solving a generalization of the graph coloring problem

**Astronomy Research** with Dr. Richard Dittion 03/2006 - 05/2009  
Rose-Hulman Institute of Technology, Terre Haute, IN

- Photographed asteroids over several nights and used images to generate lightcurves and estimates of the asteroids' rotation periods

**Participant** in Director's Summer Program 05/2008 - 08/2008  
National Security Agency, Fort Meade, MD

- Developed and implemented graph algorithms for Apache's Hadoop MapReduce framework

### Professional Service and Memberships

- Member of INFORMS Computing and Optimization Societies, 2011 - Present
- Referee for *INFORMS Journal on Computing*, *Journal of Global Optimization*, and the *Journal of Research on Educational Effectiveness*, 2014 - Present
- CS Grad Ambassador, University of Illinois at Urbana-Champaign, Spring 2014
- President of Rose-Hulman Chapter of Upsilon Pi Epsilon, 2008 - 2009
- Webmaster of Rose-Hulman Astronomy Club, 2008 - 2009