

Yevgeniy Vorobeychik
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Research Interests

Computational game theory, mechanism design, electronic commerce, simulation analysis, social and economic network analysis, complex systems, multi-agent systems, machine learning, distributed systems.

Education

University of Michigan Ann Arbor, Michigan
Ph.D. Computer Science & Engineering August 2008
Intelligent Systems Program

Adviser: Professor Michael P. Wellman

Thesis: Mechanism Design and Analysis Using Simulation-Based Game Models

Nominated for the ACM Dissertation Award

Runner-up for the IFAAMAS-08 Victor Lesser Distinguished Dissertation Award

University of Michigan Ann Arbor, Michigan
M.S.E. Computer Science & Engineering May 2004
Intelligent Systems Program

Northwestern University Evanston, Illinois
B.S. Computer Engineering (with Honors) June 2002
Economics minor
Graduated summa cum laude (GPA 3.95/4.00)

Professional Experience

June, 2010-Present: Senior Member of Technical Staff, Sandia National Laboratories, Livermore, CA.

July, 2011-Present: Visiting Scholar, University of Michigan, Computer Science and Engineering Division, Ann Arbor, MI.

August, 2008-May, 2010: Postdoctoral Researcher (advised by Professor Michael Kearns), Computer and Information Science Department, University of Pennsylvania, Philadelphia, PA.

Summer, 2007: Summer Intern, Yahoo! Research, Microeconomics Division, New York, NY.

Summer, 2005: Summer Associate, RAND Corporation, Pittsburgh, PA.

September, 2002-July, 2008: Research Assistant, University of Michigan, Computer Science and Engineering Division, Ann Arbor, MI.

Summer, 2001: Summer Intern, Visteon Corporation, Allen Park, MI.

November, 1999-June, 2002: Network Consultant, Solus, LLC, Chicago, IL.

Publications

Refereed Journals

1. Yevgeniy Vorobeychik, Jackson R. Mayo, Robert C. Armstrong, and Joseph R. Ruthruff. Non-cooperatively Optimized Tolerance: Decentralized strategic optimization in complex systems. In *Physical Review Letters*, 2011, to appear.

2. C. Seshadhri, Yevgeniy Vorobeychik, Jackson R. Mayo, Robert C. Armstrong, and Joseph R. Ruthruff. Influence and dynamic behavior in random boolean networks. In *Physical Review Letters*, 2011, to appear.
3. Yevgeniy Vorobeychik, Daniel M. Reeves, and Michael P. Wellman. Constrained automated mechanism design for infinite games of incomplete information. In *Journal of Autonomous Agents and Multiagent Systems*, 2011, to appear.
4. Yevgeniy Vorobeychik and Yagil Engel. Average-case analysis of VCG with approximate resource allocation algorithms. In *Decision Support Systems* 51(3):648-656, 2011.
5. Stephen Judd, Michael Kearns, and Yevgeniy Vorobeychik. Behavioral Dynamics and Influence in Networked Coloring and Consensus. In *Proceedings of the National Academy of Sciences* 107(34):14978-14982, 2010.
6. Yevgeniy Vorobeychik. Probabilistic analysis of simulation-based games. In *ACM Transactions on Modeling and Computer Simulation* 20(3): Article 16, 2010.
7. John Langford, Lihong Li, Yevgeniy Vorobeychik, and Jennifer Wortman. Maintaining equilibria during exploration in sponsored search auctions. In *Algorithmica* 58(4):990-1021, 2010.
8. Yevgeniy Vorobeychik and Isaac Porche. Game-theoretic methods for analysis of tactical decision-making using agent-based combat simulations. In *Military Operations Research* 14(4):21-39, 2009.
9. Yevgeniy Vorobeychik and Daniel Reeves. Equilibrium analysis of dynamic bidding in sponsored search auctions. In *International Journal of Electronic Business* 6(2):172-193, 2008.
10. Yevgeniy Vorobeychik, Michael P. Wellman, and Satinder Singh. Learning payoff functions in infinite games. In *Machine Learning* 67:145-168, 2007.
11. Michael P. Wellman, Joshua J. Estelle, Satinder Singh, Yevgeniy Vorobeychik, Christopher Kiekintveld, and Vishal Soni. Strategic interactions in a supply chain game. In *Computational Intelligence* 21(1):1-26, 2005.
12. Michael P. Wellman, Daniel M. Reeves, Kevin M. Lochner, and Yevgeniy Vorobeychik. Price prediction in a trading agent competition. In *Journal of Artificial Intelligence Research* 21:19-36, 2004.

Refereed Conferences

1. Yevgeniy Vorobeychik, Jackson R. Mayo, Robert C. Armstrong, Ronald G. Minnich, and Don W. Rudish. Fault oblivious high performance computing with dynamic task replication and substitution. In *Twenty-Sixth International Supercomputing Conference*, 2011.
2. Yevgeniy Vorobeychik. A Game Theoretic Bidding Agent for the Ad Auction Game. In *Third International Conference on Agents and Artificial Intelligence*, 2011.
3. Yevgeniy Vorobeychik and Yagil Engel. Average-case analysis of incentives under approximate allocation algorithms. In *Sixth International Workshop on Internet and Network Economics*, 251-258, 2010.
4. Quang Duong, Michael P. Wellman, Satinder Singh, and Yevgeniy Vorobeychik. History-dependent graphical multiagent models. In *Ninth International Conference on Autonomous Agents and Multiagent Systems*, 1215-1222, 2010.
5. Yevgeniy Vorobeychik and Yagil Engel. Incentive analysis of approximately efficient allocation algorithms. (Short Paper). In *Ninth International Conference on Autonomous Agents and Multiagent Systems*, 1479-1480, 2010.
6. Jacomo Corbo and Yevgeniy Vorobeychik. Nudging mechanisms for technology adoption. In *Fifth International Workshop on Internet and Network Economics*, 505-512, 2009.

7. Giacomo Corbo and Yevgeniy Vorobeychik. The effects of quality and price on adoption dynamics of competing technologies. In *Thirtieth International Conference on Information Systems*, Article 40, 2009.
8. Yevgeniy Vorobeychik and Michael P. Wellman. Strategic analysis with simulation-based games. In *Winter Simulation Conference*, 359-372, 2009.
9. Quang Duong, Yevgeniy Vorobeychik, Satinder Singh, and Michael P. Wellman. Learning graphical game models. In *Twenty-First International Joint Conference on Artificial Intelligence*, 116-121, 2009.
10. Yevgeniy Vorobeychik. Simulation-based game theoretic analysis of keyword auctions with low-dimensional bidding strategies. In *Twenty-Fifth Conference on Uncertainty in Artificial Intelligence*, 583-590, 2009.
11. Yevgeniy Vorobeychik and Michael P. Wellman. Stochastic search methods for Nash equilibrium approximation in simulation-based games. In *Seventh International Conference on Autonomous Agents and Multiagent Systems*, 1055-1062, 2008.
12. Patrick Jordan, Yevgeniy Vorobeychik, and Michael P. Wellman. Searching for approximate equilibria in empirical games. In *Seventh International Conference on Autonomous Agents and Multiagent Systems*, 1063-1070, 2008.
13. Yevgeniy Vorobeychik, Daniel M. Reeves, and Michael P. Wellman. Constrained automated mechanism design for infinite games of incomplete information. In *Twenty-Third Conference on Uncertainty in Artificial Intelligence*, 400-407, 2007.
14. Yevgeniy Vorobeychik and Daniel M. Reeves. Equilibrium analysis of dynamic bidding in sponsored search auctions. In *Third International Workshop on Internet and Network Economics*, 2007.
15. Jennifer Wortman, Yevgeniy Vorobeychik, Lihong Li, and John Langford. Maintaining equilibria during exploration in sponsored search auctions. In *Third International Workshop on Internet and Network Economics*, 2007.
16. Yevgeniy Vorobeychik, Christopher Kiekintveld, and Michael P. Wellman. Empirical mechanism design: methods, with an application to a supply chain scenario. In *Seventh ACM Conference on Electronic Commerce*, 306-315. 2006.
17. Yevgeniy Vorobeychik, Michael P. Wellman, and Satinder Singh. Learning payoff functions in infinite games. In *Nineteenth International Joint Conference on Artificial Intelligence*, 977-982. 2005.
18. Joshua J. Estelle, Yevgeniy Vorobeychik, Michael P. Wellman, Satinder Singh, Christopher Kiekintveld, and Vishal Soni. Strategic interactions in the TAC 2003 supply chain tournament. In *Fourth International Conference on Computers and Games*, 2004.
19. Christopher Kiekintveld, Michael P. Wellman, Satinder Singh, Joshua Estelle, Yevgeniy Vorobeychik, Vishal Soni and Matthew Rudary. Distributed feedback control for decision making on supply chains. In *Fourteenth International Conference on Automated Planning and Scheduling*, 384-392. 2004.

Refereed Workshops

1. Joshua Letchford and Yevgeniy Vorobeychik. Computing randomized security strategies in networked domains. In *AAAI-11 Workshop on Applied Adversarial Reasoning and Risk Modeling*, 2011.
2. Giacomo Corbo and Yevgeniy Vorobeychik. The effects of quality and price on adoption dynamics of competing technologies. In *AAAI 2009 Fall Symposium on Complex Adaptive Systems and the Threshold Effect*, 2009.

3. Yevgeniy Vorobeychik and Yagil Engel. Incentive analysis of approximately efficient allocation algorithms. In *Agent-Mediated Electronic Commerce*, 2009.
4. Yevgeniy Vorobeychik, Daniel M. Reeves, and Michael P. Wellman. Automated Mechanism Design: Framework and Applications. In *AAAI 2007 Spring Symposium on Game Theory and Decision Theory*, 2007.
5. Yevgeniy Vorobeychik and Michael P. Wellman. Mechanism design based on beliefs about responsive play. In *EC-06 Workshop on Alternative Solution Concepts for Mechanism Design*, 2006.
6. Joshua J. Estelle, Yevgeniy Vorobeychik, Michael P. Wellman, Satinder Singh, Christopher Kiekintveld, and Vishal Soni. Strategic procurement in TAC/SCM: an empirical game-theoretic analysis. In *AAMAS-04 Workshop on Trading Agent Design and Analysis*, 2004.
7. Shih-Fen Cheng, Daniel M. Reeves, Yevgeniy Vorobeychik, and Michael P. Wellman. Notes on equilibria in symmetric games. In *AAMAS-04 Workshop on Game Theory and Decision Theory*, 23-28, 2004.

Working Papers

1. Stephen Judd, Michael Kearns, and Yevgeniy Vorobeychik. Behavioral conflict and fairness in social networks.
2. Jacomo Corbo and Yevgeniy Vorobeychik. Market assessment and nudging for technology adoption under network externalities.
3. Yevgeniy Vorobeychik, Steven Kimbrough, and Howard Kunreuther. A framework for computational strategic analysis with an application to repeated interdependent security games.

Honors and Awards

- Research Grant (2011-2012), Principal Investigator “Simulation-Based Strategic Analysis of Complex Security Scenarios,” funded under the Laboratory Directed Research and Development Program for \$500K/2 years
- Finalist, Von Neumann Fellowship in Computational Science, 2009
- Nominated for the ACM Dissertation Award by the University of Michigan Electrical Engineering and Computer Science department, 2008
- Runner-up for the IFAAMAS-08 Victor Lesser Distinguished Dissertation Award
- Honorable Mention in CSE Honors Competition, 2006
- STIET (Socio-Technical Infrastructure for Electronic Transactions) Fellowship, University of Michigan, 2003-2004
- Best Computer Engineering Senior Award, Northwestern University, 2002
- William L. Everitt Student Award of Excellence, Northwestern University, 2002
- Microsoft Research Grant, Northwestern University, 2001

Professional Activities

Invited Presentations

- International Supercomputing Conference, June, 2011
- International Conference on Agents and Artificial Intelligence, January, 2011
- International Workshop on Internet and Network Economics, December, 2010
- Indiana University Purdue University Indianapolis, March, 2010
- Naval Postgraduate School, February, 2010
- Sandia National Laboratories, January, 2010
- Winter Simulation Conference, December, 2009
- AAAI Fall Symposium on Complex Adaptive Systems and the Threshold Effect, October, 2009
- Conference on Uncertainty in Artificial Intelligence, June, 2009
- Workshop on Agent-Mediated Electronic Commerce, May, 2009
- University of North Carolina, Charlotte (Software and Information Systems), February, 2009
- Workshop on Information in Networks, September, 2009
- International Conference on Autonomous Agents and Multiagent Systems, May, 2008
- RAND Corporation, March, 2008
- University of Southern California (Computer Science), March, 2008
- University of Pennsylvania (Wharton Business School, OIM), January, 2008
- Conference on Uncertainty in Artificial Intelligence, June, 2007
- Brooklyn College (Computer Science), June, 2007
- Decentralization Conference, April, 2007
- AAAI Spring Symposium on Game Theory and Decision Theory, March, 2007
- International Workshop on Internet and Network Economics, December, 2007
- ACM Conference on Electronic Commerce, June, 2006
- Workshop on Alternative Solution Concepts for Mechanism Design, June, 2006
- International Joint Conference on Artificial Intelligence, July, 2005
- International Conference on Computers and Games, 2004

Tutorials

- International Joint Conference on Artificial Intelligence, July, 2009 (Automated Mechanism Design, together with Vincent Conitzer)
- International Joint Conference on Autonomous Agents and Multiagent Systems, May, 2009 (Automated Mechanism Design, together with Vincent Conitzer)
- ACM E-Commerce Conference, July, 2008 (Automated Mechanism Design, together with Vincent Conitzer)

Reviewing

- *Journals:*
 - Journal of Artificial Intelligence Research
 - Artificial Intelligence Journal
 - Journal of Machine Learning Research
 - Operations Research
 - Journal of Autonomous Agents and Multiagent Systems
 - Production and Operations Management Journal
 - ACM Transactions on the Web
 - Computational Intelligence
 - IEEE Transactions on Services Computing
- *Conferences:*
 - ACM Conference on Electronic Commerce (program committee, EC '09, '10, '11)
 - Conference on Uncertainty in Artificial Intelligence (program committee, UAI '09, '10)
 - International Joint Conference on Autonomous Agents and Multiagent Systems (program committee, AAMAS '08, '10, '11)
 - National Conference on Artificial Intelligence (program committee, AAAI '08, '09, '10, '11)
 - International Joint Conference on Artificial Intelligence (program committee, IJCAI '09, '11)
 - International Conference on Artificial Intelligence and Statistics (program committee, AISTATS '11)

Teaching Experience

Graduate Student Instructor
University of Michigan

January, 2006–December, 2007
Ann Arbor, MI

- Taught discussion and lab sections, as well as select lectures for introductory programming courses (C++, Matlab)
- Helped faculty with course development and management
- Graded assignments and exams

Professional Society Memberships

ACM member, 2008-present
AAAI member, 2003-present
AIS member, 2009-present
INFORMS member, 2010-present
INFORMS ICS member, 2010-present

Citizenship

U.S. Citizen