Samid Hoda
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Curriculum Vitae

Research Interests

- Optimization with specific interests in convex optimization and integer programming
- Constraint programming and integrated methods for optimization
- Computational finance
- Application areas: equilibrium computation, scheduling, market clearing, transportation and logistics

Education

- Ph.D. Candidate, Algorithms, Combinatorics and Optimization (ACO), Carnegie Mellon University
  Advisor: John N. Hooker
- M.S., Algorithms, Combinatorics and Optimization (ACO), Carnegie Mellon University, 5/2007
  GPA: 4.0
- M.Math, Computer Science, University of Waterloo, 5/2002
  Project: The Polyhedral Combinatorics and Approximation of Undirected Multicuts
- B.Math, Joint Honors Computer Science and Combinatorics & Optimization, 5/2000
  Also satisfied requirements for a minor in Pure Mathematics
  Graduated with distinction

Honors and awards

- Egon Balas Award (Best Student Paper), Tepper School of Business, 2007
- William Larimer Mellon Fellowship, Tepper School of Business, 2005
- Ontario Graduate Scholarship, 2001-2002
- University of Waterloo Graduate Entrance Scholarship, 2000-2001
- Canadian Millenium Scholarship, 2000
- Runner-up Teaching Assistant Award, School of Computer Science, University of Waterloo, 2000

Industry Experience

- Consulting with ABB Corporate Research (2007-2009)
  - Developed specialized algorithms for scheduling tasks on multiple track-mounted cranes with dynamic movement constraints.
  - Implemented efficient C++ code for creating factory operating schedules.
- Research scientist at CombineNet, Inc. Pittsburgh, PA (2003-2004)
  - Developed time critical technology for clearing combinatorial markets.
  - Improved the speed, accuracy and scalability of algorithms for clearing combinatorial exchanges.
  - Developed novel algorithms and solution methods for several families of market clearing problems.
  - Delivered research presentations, including presentations for a major federal grant (NIST).

Teaching Experience

Instructor

- Carnegie Mellon University, Tepper School of Business
  Undergraduate course: Mathematical Models in Consulting (70-460, Summer 2008, rating 5.0/5.0)
- University of Windsor, Department of Mathematics and Statistics
  Undergraduate course: Mathematics for Business (62-194, Summer 2005)

Teaching Services

- University of Windsor, Department of Mathematics and Statistics
  Coordinator for Learning/Resource Center and Teaching Assistants (2004-2005)
  - Lab duties included the system administration of the undergraduate Mathematics and Statistics computer lab.
  - Teaching duties included providing one-on-one assistance to students needing help with undergraduate course work and training people to effectively use mathematical software such as Maple, Matlab and SAS.
  - Teaching Assistant Coordinator duties included assigning work and courses to undergraduate and graduate teaching assistants, handling their training and providing conflict resolution.

Teaching Assistant

- Tepper School of Business, Carnegie Mellon University: Teaching Assistant
  Supervisors: Miguel Lejeune, Javier Peña, Sam Burer, François Margot, Egon Balas and Michael Trick
  - Ph.D. courses:
    - Linear Programming (47-834, Mini I 2008)
    - Convex Polytopes (47-861, Mini II 2008)
  - Executive courses:
    - Optimization for Risk Management and Hedging (47-730, Summer 2007)
  - Master in Computational Finance courses:
    - Dynamic Asset Management (45-908, Mini II 2008)
  - Master in Business and Administration courses:
    - Mining Data for Decision Making (45-963, Mini IV 2009)
    - Sequencing and Scheduling (45-866, Mini IV 2008)
    - Optimization and Decision Making (45-760, Mini I 2008, Mini I 2009)
    - Operations Research Techniques for Consultants (45-860, Mini IV 2007)
    - Probability and Decision Making (45-730, Mini I 2006, Mini III 2007, Mini III 2008)
- University of Waterloo, Faculty of Mathematics: Teaching Assistant
  Supervisors: Kathryn Hare, Prabhakar Ragde, Daniel Brown, Naomi Nishimura and Therese Biedl
  - Undergraduate courses:
    - Algorithms (CS 341, 2001)
    - Computer Organization and Design (CS 251, 2001)
    - Digital Design and Architecture (CS 351, 2000)
    - Linear Algebra II (Math 235, 1999)

Other Teaching Related Activities

- Attended twelve teaching seminars offered by the Eberly Center for Teaching Excellence at Carnegie Mellon. The topics covered include: overview of student cognition; monitoring your teaching effectiveness; conducting productive and engaging discussions; course and syllabus design; supporting students through good assessment practices; working well one-on-one; using case studies to actively engage students; teaching controversial topics; handling problematic student behavior; planning and delivering effective lectures; teaching large classes; promoting meaningful and engaged knowledge through service learning

Refereed conference and workshop papers

- Andrew Gilpin, Samid Hoda, Javier Peña, and Tuomas Sandholm. Gradient-based algorithms for finding Nash equilibria in extensive form games. International Workshop on Internet and Network Economics (WINE), San Diego, California, 2007.

Working papers

- Ionuţ Aron, Latife Genç-Kaya, Iiro Harjunkoski, Samid Hoda, and J. N. Hooker, Optimal movement of factory cranes. (Submitted for publication in October 2008)
- Samid Hoda, Andrew Gilpin, Javier Peña, and Tuomas Sandholm, Smoothing techniques for computing Nash equilbria of sequential games. (Under revision for Mathematics of Operations Research)
- Samid Hoda, Egon Balas, and François Margot, Revisiting the Constraint Activating Outer Polar Method for 0-1 programming.
- Samid Hoda, J. N. Hooker, and Willem-Jan van Hoeve, MDD-Based propagation of `among` constraints.
- Ben Peterson, Iiro Harjunkoski, Samid Hoda and J. N. Hooker, An algorithm for scheduling multiple factory cranes on a common track.

Selected talks and presentations

- Samid Hoda, Andrew Gilpin, Javier Peña. Constructing "Nice" Prox Functions for Sets Arising from a Class of Multistage Optimization Problems. At the "Computational Game Theory" session at the 20th International Symposium on Mathematical Programming (ISMP), Chicago, IL, August 2009.
- Samid Hoda, Egon Balas, and François Margot. Revisiting the Constraint Activating Outer Polar Method for 0-1 Programming. At the "Computation Integer Programming" session at the INFORMS (Institute for Operations Research and the Management Sciences) Annual Meeting, Washington, DC, October 2008.
- Samid Hoda, Ben Peterson, Ionuţ Aron, Latife Genç-Kaya, Iiro Harjunkoski, and J. N. Hooker. Optimal Crane Scheduling. At the Enterprise-Wide Optimization Annual Meeting, Pittsburgh, Pennsylvania, 2008.
- Samid Hoda, Andrew Gilpin, Javier Peña, and Tuomas Sandholm. Computational Experience with a First-order Algorithm for Computing Nash Equilibria in Sequential Games. At the "Advances in interior point methods and conic feasibility problems" session at ICCOPT/MOPTA (International Conference on Continuous Optimization/Modeling and Optimization: Theory and Applications) , Hamilton, Ontario, August 2007.
- Revisiting the Constraint Activating Outer Polar Method. Tepper School of Business Operations Research Seminar, 2007.
- Samid Hoda, Andrew Gilpin, Javier Peña, and Tuomas Sandholm. Computing Equilibria Arising From Large Sequential Games. At the "Applications of Linear Programming" session at the INFORMS (Institute for Operations Research and the Managment Sciences) Annual Meeting, Pittsburgh, PA, November 2006.
- A Gradient-Based Approach for Computing Nash Equilibria of Large Sequential Games. Tepper School of Business Operations Research Seminar, 2006.

- Tuomas Sandholm, Bryan Bailey, Andrew Fuqua, Andrew Gilpin, Samid Hoda, Tom Kuhn, David Levine, David C. Parkes, Rob Shields, Yuri Smirnov, and Subhash Suri. Real-World Combinatorial Procurement Auctions. At the "Revenue Management and Dynamic Pricing" session at the INFORMS (Institute for Operations Research and the Managment Sciences) Annual Meeting, Denver, CO, October 2004. (Talk given by David Levine)
- Tuomas Sandholm, Bryan Bailey, Andrew Fuqua, Andrew Gilpin, John Heitmann, Samid Hoda, Tom Kuhn, David Levine, Rob Shields, Yuri Smirnov, and Subhash Suri. Industrial Procurement Auctions with Expressive Competition. At the "Combinatorial Auctions" session at the INFORMS (Institute for Operations Research and the Managment Sciences) Annual Meeting, Atlanta, GA, 2003. (Talk given by David)
- The Polyhedral Combinatorics of Undirected Multicuts. University of Waterloo Theory Seminar, 2002.
- A Bounded Model Checker for the Watmc Software Project. University of Waterloo Formal Methods Seminar, 2002.
- When Linear Programming Isn't Enough. University of Waterloo C&O Undergraduate Research Seminar, 2002.

Professional service

Journal reviewing

- SIAM Journal of Optimization.

Departmental and Group Services

- Resurrected undergraduate Mathematics and Statistics Club at the University of Windsor.
- Member and Secretary of the Computer Science Club at the University of Waterloo.
- Member of the Purse Math, Applied Math, C&O Club at the University of Waterloo.
- Member and office volunteer for the Mathematics Society at the University of Waterloo.

Graduate Coursework

Optimization

- Linear Programming, Advanced Linear Programming, Integer Programming, Advanced Integer Programming, Semidefinite Programming, Optimization Logic and Constraint Satisfaction, Open Source Software for Optimization

Combinatorics

- Convex Polytopes, Graph Theory, Networks and Matchings, Discrete Mathematics

Other Mathematics

- Graduate Algebra, Real Analysis, Lebesgue Integration, Advanced Probability Overview, Mathematics of Public Key Cryptography

Computer Science

- Performance Modeling (Stochastic Processes), Graduate Algorithms, Algorithms in the Real World, Distributed Computing, Topics in Scientific Computation (High Performance Computing), Computer Aided Verification, Cryptography/Network Security, Advanced Topics in Software Design (Modularity in Model Checking)

Computing Skills

Programming:	C, C++, OCaML, Standard ML, Perl, Scheme, Modula-3, Fortran, Basic
Platforms:	Unix(Linux, BSD, Solaris), Windows, Mac OS X
Libraries:	CPLEX, COIN-OR, Xpress, MPI
Packages:	Maple, Mathematica, Matlab, S-Plus/R, LaTeX, Polymake, cdd, PORTA

References

- Available upon request.