

Jan Vondrák

Nationality: Czech
Birth date: May 23, 1974
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IBM Almaden Research Center
650 Harry Rd
San Jose, CA 95120

Research interests **Combinatorics and Algorithms.**
Recent work includes combinatorial optimization and approximation algorithms. Also interested in probabilistic combinatorics, stochastic optimization and computational complexity.

Current position IBM ALMADEN RESEARCH CENTER, San Jose, CA.
Research Staff Member, since 2009.

Work experience PRINCETON UNIVERSITY, Princeton, NJ.
Postdoctoral teaching fellow, Council on Science and Technology, 2006-09.

MICROSOFT RESEARCH, Redmond, WA.
Postdoctoral position: Theory group, 2005-06.

MATHEMATICAL SCIENCES RESEARCH INSTITUTE, Berkeley, CA.
Membership: Spring 2005 program in Probability, Algorithms and Statistical Physics.

Education MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA.
Ph.D. in Applied Mathematics, 2000-05.
Thesis title: *Probabilistic Methods in Combinatorial and Stochastic Optimization*.
Advisor: Michel Goemans.

CHARLES UNIVERSITY, Prague, Czech Republic.
Ph.D. in Computer Science, 1999-2000, completed 2007.
Thesis title: *Submodularity in Combinatorial Optimization*.
Advisor: Martin Loebl.

CHARLES UNIVERSITY, Prague, Czech Republic.
Master's degree in Computer Science, 1995-1999.
Thesis title: *Implementation and Testing of a New Max-Cut Algorithm*.
Advisor: Martin Loebl.

CHARLES UNIVERSITY, Prague, Czech Republic.
Bachelor's degree in Physics, 1992-1995.

Publications *Maximizing a submodular set function subject to a matroid constraint*
(with C. Calinescu, C. Chekuri and M. Pál), to appear in SIAM Journal on Computing.

A randomized embedding algorithm for trees
(with B. Sudakov), to appear in Combinatorica.

Disjoint bases in a polymatroid
(with G. Calinescu and C. Chekuri), to appear in Random Structures and Algorithms.

Submodularity and curvature: the optimal algorithm
(single author), to appear in Kokyuroku Bessatsu, Kyoto, Japan.

- Symmetry and approximability of submodular maximization problems*
(single author), in 50th IEEE FOCS (2009), 651–670.
- Submodular maximization over multiple matroids via generalized exchange properties*
(with J. Lee and M. Sviridenko), in APPROX 2009, 244–257.
- Tight information-theoretic lower bounds for welfare maximization in combinatorial auctions*
(with V. Mirrokni and M. Schapira), in EC 2008.
- Optimal approximation for the Submodular Welfare Problem in the value oracle model*
(single author), in 40th ACM STOC (2008), 67–74.
- Maximizing non-monotone submodular functions*
(with U. Feige and V. Mirrokni), in 48th IEEE FOCS (2007), 461–470.
- Maximizing a submodular set function subject to a matroid constraint*
(with C. Calinescu, C. Chekuri and M. Pál), in 12th IPCO (2007), 182–196.
- Approximation algorithms for allocation problems: Improving the factor of $1 - 1/e$*
(with U. Feige), in 47th IEEE FOCS (2006), 667–676.
- How many random edges make a dense hypergraph non-2-colorable?*
(with B. Sudakov), Random Structures and Algorithms 32 (2008), 290–306.
- Shortest-path metric approximation for random subgraphs*
(single author), Random Structures and Algorithms 30:1-2 (2007), 95–104.
- Covering minimum spanning trees of random subgraphs*
(with M. Goemans), Random Structures and Algorithms, 29:3, 257–276 (2006);
conference version in 15th ACM-SIAM SODA, 927–934.
- Stochastic covering and adaptivity*
(with M. Goemans), in LATIN 2006: Theoretical informatics, 532–543, LNCS 3887 (2006).
- A Ramsey-type result for the hypercube*
(with N. Alon, B. Sudakov and R. Radoičić), Journal of Graph Theory 53 (2006), 196–208.
- On the diameter of separated point sets with many nearly equal distances*
(with J. Pach and R. Radoičić), European Journal of Combinatorics, 27:8, 1321–1332 (2005).
- Adaptivity and approximation for stochastic packing problems*
(with B. Dean and M. Goemans), in 16th ACM-SIAM SODA, 395–404 (2005).
- Approximating the stochastic knapsack problem: the benefit of adaptivity*
(with B. Dean and M. Goemans), in 45th IEEE FOCS, 208–217 (2004).
- Wide partitions, Latin tableaux and Rota’s basis conjecture*
(with T. Chow, K. Fan and M. Goemans), Advances in Applied Mathematics, 31:2, 334–358 (2003).
- Towards a theory of frustrated degeneracy*
(with M. Loebl), Discrete Mathematics 271, 179–193 (2003).
- Optimization via enumeration: a new algorithm for the Max-Cut problem*
(with M. Loebl and A. Galluccio), J. of Math. Programming 90-2A, 273–290 (2001).
- The limit checker number of a graph*
(with R. Šámal), Discrete Mathematics 235, 343–347 (2001).
- New algorithm for the Ising problem: Partition function for finite lattice graphs*
(with M. Loebl and A. Galluccio), Physical Review Letters 84-26, 5924–5927 (2000).
- Visibility representations of complete graphs*
(with R. Babilon, H. Nyklová and O. Pangrác), Graph drawing 1999, LNCS 1731, Springer, 333–340.

Selected presentations

- 50th IEEE Symposium on Foundations of Computer Science (FOCS), Atlanta, GA, October 2009:
Symmetry and approximability of submodular maximization problems.
- 20th International Symposium on Mathematical Programming, Chicago, IL, August 2009:
Symmetry and approximability of submodular maximization problems.
- 12th International Workshop on Approximation, Randomization and Combinatorial Optimization (APPROX/RANDOM), Berkeley, CA, August 2009:
Submodular maximization over multiple matroids via generalized exchange properties.
- 40th ACM Symposium on Theory of Computing (STOC), Victoria, BC, Canada, May 2008:
Optimal approximation for the Submodular Welfare Problem in the value oracle model.
- 48th IEEE Symposium on Foundations of Computer Science (FOCS), Providence, RI, October 2007:
Maximizing non-monotone submodular functions.
- AMS central section meeting, Chicago, IL, October 2007:
Nearly optimal embeddings of trees.
- 12th Conference on Integer Programming and Combinatorial Optimization (IPCO), Ithaca, NY, June 2007:
Maximizing a submodular set function subject to a matroid constraint.
- 47th IEEE Symposium on Foundations of Computer Science (FOCS), Berkeley, CA, October 2006:
Approximation algorithms for allocation problems: Improving the factor of $1 - 1/e$.
- SIAM Conference on Discrete Mathematics, Victoria, BC, Canada, June 2006:
2-colorability of randomly perturbed hypergraphs.
- Latin American Theoretical Informatics, Valdivia, Chile, March 2006:
Stochastic covering and adaptivity.
- Workshop on probabilistic combinatorics, Banff center, Alberta, Canada, November 2005:
2-colorability of randomly perturbed hypergraphs.
- AMS eastern section meeting, Bard College, NY, October 2005:
Ramsey subgraphs of the hypercube.
- 16th ACM-SIAM Symposium on Discrete Algorithms (SODA), Vancouver, BC, January 2005:
Adaptivity and approximation for stochastic packing problems.
- Workshop on combinatorial optimization, Bertinoro, Italy, May 2004:
Covering minimum spanning trees of random subgraphs.
- 15th ACM-SIAM Symposium on Discrete Algorithms (SODA), New Orleans, LA, January 2004:
Covering minimum spanning trees of random subgraphs.
- Discrete Optimization Oberseminar, Bonn, 2004:
Stochastic Knapsack.
- 5th Czechoslovak International Symposium on Combinatorics, Prague, 1998:
The limit checker number.

Fellowships and awards

- Council on Science and Technology Fellowship, Princeton University, 2006-09.
- Walter A. Roseblith Fellowship, MIT, 2000-01.
- DIMACS-REU stipend, Rutgers University, 1999.

Teaching experience

- Lecturer in *Calculus and Analytical Geometry*, Princeton, Fall 2008.
- Lecturer (head of the course) in *Combinatorial Mathematics*, Princeton, Spring 2008.
- Lecturer (head of the course) in *Calculus and Analytical Geometry*, Princeton, Spring 2007.

Recitation instructor in *Multivariable Calculus* (prof. Hartley Rogers), MIT, Fall 2004.
Recitation instructor in *Multivariable Calculus* (prof. Arthur Mattuck), MIT, Fall 2003.
MIT micro-teaching workshop (prof. Michel Goemans), Fall 2003.
Teaching assistant in *Probability Theory* (prof. Balint Virág), MIT, Fall 2002.
Teaching assistant in *Advanced Algorithms* (prof. Michel Goemans), MIT, Fall 2001.
Recitation instructor in *Discrete Mathematics*, Charles University, Prague, 1999-2000.
Recitation instructor in *Linear Algebra*, Charles University, Prague, 1998-1999.

**Professional
Activities**

Program committee member, SODA 2010.
Program committee member, APPROX 2008.
Referee for an NSA grant proposal in mathematical sciences, 2006.
Referee for *Random Structures and Algorithms*, 2005-08.
Referee for *Mathematics of Operations Research*, 2006-08.
Referee for *SIAM Journal of Combinatorics*, 2003-07.
Referee for *Discrete Mathematics*, 2006-08.
Referee for *FOCS, STOC, SODA, IPCO and APPROX/RANDOM* conferences, 2004-08.

**General
Skills**

Languages: English, French (passive), German (passive), Russian (passive), Czech (native).
Computer skills: C++, Pascal, Java, Maple, Mathematica and Matlab.