Yuri Faenza

Contact information

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Research interests

Discrete optimization, Polyhedral combinatorics, Operations research

Employment

From 2016:	Assistant Professor IEOR Department, Columbia University, New York, USA
2015-2016:	SNSF Ambizione Fellow DISOPT group, EPFL, Lausanne, Switzerland
2014:	Post-doctoral researcher Mathematics Department, ULB, Brussels, Belgium
2012-2014:	Post-doctoral researcher DISOPT group, EPFL, Lausanne, Switzerland
2010-2012:	Post-doctoral researcher Mathematics Department, Università di Padova, Padua, Italy
2006:	Intern Discrete Optimization group, Zuse Institute Berlin, Berlin, Germany

Education

2010:	Ph.D. in Operations Research Sapienza Università di Roma, Rome, Italy Advisor: Prof. Gianpaolo Oriolo
2006:	M. Sc. in Mathematical Engineering, *summa cum laude* Università di Roma Tor Vergata, Rome, Italy Advisors: Prof. Gianpaolo Oriolo and Prof. Volker Kaibel
2004:	B. Sc. in Management Science and Engineering, *summa cum laude* Università di Roma Tor Vergata, Rome, Italy Advisors: Prof. Gianpaolo Oriolo and Prof. Benedetto Scoppola

Awards, grants, qualifications

2018:	*Distinguished Faculty Teaching Award*, The Fu Foundation School of Engineering, Columbia University, New York, USA
2017:	Qualification as *Professore Associato* (Associate Professor), Italian academic system
2017:	Gift by the SNSF, to continue research in the spirit of the *Ambizione* grant
2014:	SNSF *Ambizione* Grant (ca. 340.000 USD)
2013:	Qualification as *Maître de Conférence*, French academic system

2012:	*Lorenzo Brunetta* prize for a Ph.D. thesis in Operations Research defended during the years 2010-11-12 (1 prize awarded every 3 years)
2007:	*Adonet* scholarship, granted by the Marie Curie RTN
2007:	*Sebastiano and Rita Raeli* award for the results in the M.Sc. program
2006-2009:	Ph.D. Scholarship, granted by the Italian Ministry of Education
2006:	*Leonardo* Scholarship, granted by the European Union

Visiting positions (one month or more), selected invited talks

Nov 2015:	Universität Bonn, Germany, within the trimester program of HIM (Hausdorff Research Institute for Mathematics) in Combinatorial Optimization
June 2012:	University of Waterloo, Canada
Apr-May 2010:	University of Waterloo, Canada
Oct-Nov 2009:	Université de Bordeaux, France
May-Dec 2007:	Otto-von-Guericke-Universität Magdeburg, (Germany)
Invited talks at:	Universidad de Buenos Aires (Argentina), ULB (Belgium), University of Waterloo, Polytechnique Montreal (Canada), Université Bordeaux 1, Université J. Fourier Grenoble, and Université Paris-Dauphine (France), TU Darmstadt and Universität Bonn (Germany), Tel Aviv University (Israel), Università di Padova, Università di Roma *Sapienza* and *Tor Vergata* (Italy) RIKEN (Japan), EPFL (Switzerland), Clemson University, Columbia University, Georgia Tech, Rutgers, IBM Watson Research center, and Simons Institute (USA).

Teaching Experience

Spring 2018, 2019:	IEOR E6614: Optimization II, IEOR, Columbia University, USA (for Ph.D. students)
Fall 2017, 2018:	IEOR E4004: Optimizations models and methods, IEOR, Columbia University, USA (for M.Sc. students)
Spring 2017:	IEOR E8100: Introduction to discrete optimization, IEOR, Columbia University, USA (for Ph.D. students)
Spring 2017-19:	IEOR E4008 (prev. E4573): Computational discrete optimization, IEOR, Columbia University, USA (for M.Sc. students)
Spring 2016:	Strong relaxations for discrete optimization problems, EPFL, Switzerland (for Ph.D. students in Math, OR, and CS)
Spring 2011, 2012:	Discrete optimization, Università di Padova, Italy (for B.Sc. students in Mathematics)

Student supervision

Current:

Vladlena Powers	From 2017, Ph.D. student at Columbia University, USA
Lingyi Zhang	From 2018, Ph.D. student at Columbia University, USA
Xuan Zhang	From 2017, Ph.D. student at Columbia University, USA

Past:

Igor Malinović	Ph.D. 2019, EPFL, Switzerland (jointly with F. Eisenbrand) Thesis: *On approximation algorithms and polyhedral relaxations for knapsack problems, and clustered planarity testing*
Manuel F. Aprile	Ph.D. 2018, EPFL, Switzerland (jointly with F. Eisenbrand) Thesis: *On some problems related to 2-level polytopes*
Jana Cslovjecsek	M.Sc. 2018, EPFL, Switzerland (jointly with F. Eisenbrand)
Stefano Piceghello	B.Sc. 2012, Università di Padova, Italy (jointly with M. Conforti)
Riccardo Focchiatti	B.Sc. 2012, Università di Padova, Italy (jointly with M. Di Summa)
Marco Senatore	M.Sc. 2010, Università di Roma Tor Vergata, Italy (jointly with G. Oriolo)

Professional service

Reviewer for journals, such as Operations Research, Mathematical Programming, Mathematics of OR, Siam Journal on Optimization, Algorithmica, Siam Journal on Discrete Mathematics, OR Letters, Naval Research Logistics, Discrete & Computational Geometry; and international conferences, such as: IPCO, SODA, STOC, ESA.

Organizer of the following sessions: *Strengths and Limits of Linear Programming Formulations* at the 22nd International Symposium on Mathematical Programming (ISMP), 2015; *New Techniques in Discrete and Mixed-discrete Optimization* at the 2018 INFORMS Optimization Society Conference.

Organizer of the cycle of seminars *Algoritmi a colazione* (Algorithms for breakfast), Università di Roma Tor Vergata, Italy (2008-2010); of the DISOPT seminars, EPFL, Switzerland (2012-2014; 2015-2016); of the IEOR–DRO seminars, Columbia University, USA (from 2017).

Expert evaluator for projects/papers in the Optimization area for the Romanian (2011) and Italian (2016) Ministries of Education.

Publications

In journals:

1. M. Conforti, M. Di Summa, and Y. Faenza. Balas formulation for the union of polytopes is optimal. Mathematical Programming A, to appear.
2. A. Bohn, Y. Faenza, S. Fiorini, V. Fisikopoulos, M. Macchia, and K. Pashkovich. Enumeration of 2-level polytopes. Mathematical Programming Computation, 11-1 (2019), pp. 173–210.
3. M. Aprile, A. Cevallos, and Y. Faenza. On 2-level polytopes arising in combinatorial settings. SIAM Journal on Discrete Mathematics Vol. 32, No. 3 (2018), pp. 1857-1886.
4. M. Conforti, A. Del Pia, M. Di Summa, and Y. Faenza: Reverse Split rank. Mathematical Programming B, 154-1 (2016), pp. 273–303.

5. Y. Faenza, S. Fiorini, R. Grappe, and H.R. Tiwary. Extended formulations, non-negative factorizations, and randomized communication protocols, Mathematical Programming B, 153-1 (2015), pp. 75–94.
6. Y. Faenza and L. Sanità. On the existence of compact epsilon-approximation for the knapsack polytope in the original space. Operations Research Letters 43-3 (2015), pp. 339–342.
7. M. Conforti, A. Del Pia, M. Di Summa, Y. Faenza, and R. Grappe. Reverse Chvátal-Gomory rank, SIAM J. Discrete Math.: 29-1 (2015), pp. 166–181
8. Y. Faenza, G. Oriolo, and G. Stauffer. Solving the weighted stable set problem in claw-free graphs via decomposition, Journal of the ACM, 61-4 (2014): 20.
9. G. Averkov, M. Conforti, A. Del Pia, M. Di Summa, and Y. Faenza. On the convergence of the affine hull of the Chvátal-Gomory closures, SIAM J. Discrete Math. 27-3 (2013), pp. 1492–1502.
10. F. Bonomo, Y. Faenza, and G. Oriolo. On coloring problems with local constraints, Discrete Mathematics, Vol. 312, Issues 1213 (2012), pp. 2027–2039.
11. Y. Faenza, G. Oriolo, and C. Snels. A fast algorithm to remove proper and homogeneous pairs of cliques (while preserving some graph invariants), Operations Research Letters, Vol. 39, Issue 3 (2011), pp. 213–217.
12. Y. Faenza and V. Kaibel. Extended Formulations for Packing and Partitioning Orbitopes, Mathematics of Operations Research Vol. 34, No. 3 (2009), pp. 686–697.

In conferences with published, peer-reviewed proceedings:

13. M. Aprile and Y. Faenza. Extended formulations from communication protocols in output-efficient time. Proceedings of IPCO 2019, to appear.
14. Y. Faenza, T. Kavitha, V. Powers, and Xingyu Zhang. Popular Matchings and Limits to Tractability. Proceedings of the 30th ACM-SIAM Symposium on Discrete Algorithms (SODA 2019).
15. Y. Faenza, I. Malinovic, M. Mastrolilli, and O. Svensson. On bounded pitch inequalities for the min-knapsack polytope. Proceedings of ISCO 2018.
16. Y. Faenza and I. Malinovic. A PTAS for the Time-Invariant Incremental Knapsack problem. Proceedings of ISCO 2018.
17. M. Aprile, Y. Faenza, S. Fiorini, T. Huynh, and M. Macchia. Extension complexity of stable set polytopes of bipartite graphs. Proceedings of the 43rd Int. Workshop on Graph-Theoretic Concepts in Computer Science (WG 2107)
18. M. Aprile, A. Cevallos, and Y. Faenza. On vertices and facets of combinatorial 2-level polytopes. Proceedings of the Fourth International Symposium on Combinatorial Optimization (ISCO 2016), pp 177-188

19. A. Bohn, Y. Faenza, S. Fiorini, V. Fisikopoulos, M. Macchia, and K. Pashkovich. Enumeration of 2-level polytopes. Proceedings of the Twenty-Third European Symposium on Algorithms (ESA 2015), pp. 191–202
20. M. Di Summa, F. Eisenbrand, Y. Faenza, and C. Moldenhauer. On largest volume simplices and sub-determinants, Proceedings of the Twenty-Sixth Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2015), pp. 315–323
21. A. Bock, Y. Faenza, C. Moldenhauer, and A. Ruiz-Vargas. Solving the stable set problem in terms of the odd cycle packing number. Proceedings of the 34th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2014), pp.187–198
22. M. Conforti, A. Del Pia, M. Di Summa, and Y. Faenza. Reverse Split rank, Proceedings of the 16th Conference on Integer Programming and Combinatorial Optimization (IPCO 2014), pp 234–248
23. M. Conforti, A. Del Pia, M. Di Summa, Y. Faenza, and R. Grappe. Reverse Chvátal-Gomory rank, Proceedings of the 16th Conference on Integer Programming and Combinatorial Optimization (IPCO 2013), pp 133–144
24. Y. Faenza, S. Fiorini, R. Grappe, and H.R. Tiwary: Extended formulations, non-negative factorizations, and randomized communication protocols, Proceedings of the 2nd International Symposium on Combinatorial Optimization (ISCO 2012), pp. 129–140
25. Y. Faenza, G. Oriolo, and G. Stauffer. Separating stable sets in claw-free graphs via Padberg-Rao and compact linear programs, Proceedings of the Twenty-Third Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2012), January 2012, pp. 1298–1308
26. Y. Faenza, G. Oriolo, and G. Stauffer. An algorithmic decomposition of claw-free graphs leading to an $O(n^3)$-algorithm for the weighted stable set problem, Proceedings of the Twenty-Second Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2011), January 2011, pp. 630–646
27. F. Bonomo, Y. Faenza, and G. Oriolo. On coloring problems with local constraints, Electronic Notes in Discrete Mathematics, 35 (2009) pp. 215–220 (Proceedings of LAGOS'09)

In books:

28. Y. Faenza, G. Oriolo, G. Stauffer, and P. Ventura: Stable sets in claw-free graphs: a journey through algorithms and polytopes, in A. Ridha Mahjoub, editor, Progress in Combinatorial Optimization, Ed. Wiley-ISTE (2011), pp. 41–80