

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 *Maitre 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: Università di Padova, Sapienza Università di Roma,
and Università di Roma Tor Vergata (Italy)
University of Waterloo (Canada), EPFL (Switzerland),
Université Bordeaux 1, Université J. Fourier Grenoble,
and Université Paris-Dauphine (France)
Universidad de Buenos Aires (Argentina), ULB (Belgium),
TU Darmstadt and Universität Bonn (Germany)
Georgia Tech, Columbia University,
IBM Watson Research center, and Simons Institute (USA)

Teaching

- Spring 2018: IEOR E6614: Optimization II,
IEOR, Columbia University, USA (for Ph.D. students)
- Fall 2017: 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, 2018: IEOR 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 2012: Discrete optimization, Università di Padova, Italy
(for B.Sc. students in Mathematics)
- Spring 2011: Discrete optimization, Università di Padova, Italy
(for B.Sc. students in Mathematics)

**Student
supervision**

- Xuan Zhang From 2017, Ph.D. student at Columbia University, New York (USA)
- Vladlena Powers From 2017, Ph.D. student at Columbia University, New York (USA)
- Lingyi Zhang From 2018, Ph.D. student at Columbia University, New York (USA)
- 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 Mathematical Programming, Mathematics of OR, Siam Journal on Optimization, Siam Journal on Discrete Mathematics, OR Letters, Naval Research Logistics, Discrete & Computational Geometry; and international conferences, such as: IPCO, SODA, STOC, ESA.

Organizer and Chair for the session *Strengths and Limits of Linear Programming Formulations* at the 22nd International Symposium on Mathematical Programming (ISMP), 2015.

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, A. Del Pia, M. Di Summa, and Y. Faenza: Reverse Split rank. *Mathematical Programming B*, 154-1 (2016), pp. 273–303
2. 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
3. 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
4. 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
5. 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
6. 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
7. F. Bonomo, Y. Faenza, and G. Oriolo: On coloring problems with local constraints, *Discrete Mathematics*, Vol. 312, Issues 1213 (2012), pp. 2027–2039
8. 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
9. 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:

10. Y. Faenza, I. Malinovic, M. Mastrolilli, and O. Svensson. On bounded pitch inequalities for the min-knapsack polytope. Proceedings of ISCO 2018.
11. Y. Faenza and I. Malinovic. A PTAS for the Time-Invariant Incremental Knapsack problem. Proceedings of ISCO 2018.
12. 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)
13. 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
14. 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
15. 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
16. 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
17. 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
18. 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
19. 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
20. 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
21. 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

22. 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:

23. 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