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RESEARCH INTERESTS

I am currently a postdoctoral researcher under the supervision of Dr. Andrea Lodi.

My goal is to solve practical optimization problems through the development of new models and theoretical and methodological tools. For example, I am interested in:

- Building general-purpose methods for solving mixed-integer programs, with particular focus on cutting plane theory and implementation
- Improving applications of discrete optimization, such as within computational social choice, including optimization of organ transplants (e.g., kidney exchange) and the fair division of indivisible goods
- Analyzing stochastic models to incorporate data uncertainty, particularly to understand stability of solutions with respect to perturbations in underlying data

My future research agenda includes continued work on mixed-integer linear programming, but also to:

- Enhance methodology for nonlinear optimization, especially extending insights from the linear setting
- Generate improved empirical and theoretical tools for analyzing integer programming solution methods, particularly through the integration of machine learning techniques
- Apply optimization methodology to generate adaptive, data-driven solutions for allocating resources in humanitarian contexts and other problems related to social good

EDUCATION

Carnegie Mellon University, Tepper School of Business, Pittsburgh, PA, USA

M.S. in Algorithms, Combinatorics, and Optimization

May 2013

Ph.D. in Algorithms, Combinatorics, and Optimization

May 2018

Selected Course Work:

Linear Programming	Graduate Algorithms	Discrete Mathematics	Convex Analysis
Integer Programming	Machine Learning Theory	Performance Modeling	Real Analysis
Graph Theory	Algorithmic Game Theory	Random Graphs	Lebesgue Measure
Networks & Matchings	A Theorist's Toolkit	Mixed-Integer Nonlinear	Programming

Cornell University, College of Engineering, Ithaca, NY, USA

B.S. in Operations Research and Engineering with Honors, *Magna Cum Laude*

May 2011

Selected Course Work:

Engineering Stochastic Processes	Engineering Probability and Statistics I/II	Decision Theory
Simulation Modeling and Analysis	Heuristic Methods for Optimization	Game Theory

PUBLICATIONS

- [1] P.I. Frazier and A.M. Kazachkov, “Guessing Preferences: A New Approach to Multi-Attribute Ranking and Selection”, *Winter Simulation Conference*, 2011.
- [2] J. Karp, A.M. Kazachkov, and A.D. Procaccia, “Envy-Free Division of Sellable Goods”, *AAAI Conference on Artificial Intelligence*, 2014.
- [3] J.P. Dickerson, A.M. Kazachkov, A.D. Procaccia, and T. Sandholm. “Small Representations of Big Kidney Exchange Graphs”, *AAAI Conference on Artificial Intelligence*, 2017.

Also appears at:

- Workshop on AI and OR for Social Good (AIORSocGood), AAAI 2017
- Exploring Beyond the Worst Case in Computational Social Choice (EXPLORE) Workshop, AAMAS 2016

- [4] G. Benadè, A.M. Kazachkov, A.D. Procaccia, and C.-A. Psomas. “How to Make Envy Vanish Over Time”, *ACM Conference on Economics and Computation*, 2018.

SUBMITTED [5] A.M. Kazachkov, S. Nadarajah, E. Balas, and F. Margot. “Partial Hyperplane Activation for Generalized Intersection Cuts”, under revision.

WORKING PAPERS [6] “ \mathcal{V} -Polyhedral Cuts”, in preparation.

[7] “Cutting Planes by Tilting”, in preparation.

[8] “Correspondence Between \mathcal{V} -Polyhedral Cuts and Lift-And-Project Cuts”.

PRESENTATIONS ISMP 2018, Invited Talk, “Computational Results with \mathcal{V} -Polyhedral Cuts and Strengthening Approaches”

Lehigh University, June 12, 2018, Invited Talk, “Disjunctive Cuts Through the \mathcal{V} -Polyhedral Lens”

INFORMS 2017, Invited Talk, “ \mathcal{V} -Polyhedral Cuts”

NemFest 2017, Poster, “ \mathcal{V} -Polyhedral Cuts”

Aussois Combinatorial Optimization Workshop 2017, “From Final Point Cuts to \mathcal{V} -Polyhedral Cuts”

INFORMS 2016, Invited Talk, “Final Point Generalized Intersection Cuts”

EURO 2016, “Final Point Generalized Intersection Cuts”

MIP 2016, Poster, “Cutting Planes by Tilting”

IOS 2016, “Final Point Generalized Intersection Cuts”

INFORMS 2015, Invited Talk, “Feasible Versus Infeasible Intersection Points for Cut Generation”

ISMP 2015, “Partial Hyperplane Activation for Generalized Intersection Cuts”

INFORMS 2014, Invited Talk, “Computational Investigation of Generalized Intersection Cuts”

MIP 2014, Poster, “Computational Investigation of Generalized Intersection Cuts”

TEACHING EXPERIENCE Future Faculty Program, CMU 2018

Instructor, 70-460 Mathematical Models for Consulting, business undergraduate elective, CMU 2014

Teaching Assistant, CMU

• 47-861 Convex Polyhedra, Ph.D. elective 2016

• 47-836 Networks and Matchings, Ph.D. core course 2015

• 47-830 Integer Programming, Ph.D. core course 2015, 2017

• 21-366 Combinatorial Optimization, mathematics undergraduate elective 2014

• 45-750 Probability and Statistics, MBA core course 2013

• 47-831 Advanced Integer Programming, Ph.D. core course 2013, 2015, 2017

• 47-835 Graph Theory, Ph.D. core course 2012, 2015

Recitation Leader, 45-751 Optimization, MBA core course, CMU 2012–2013

Teaching Assistant, Operations Research Core Courses, Cornell 2010

Facilitator, Academic Excellence Workshop for Calculus I for Engineers, Cornell 2008

PROFESSIONAL EXPERIENCE **Operations Research Intern** Summer 2010

ZS Associates, Princeton, NJ, USA

- Evaluated downsizing and restructuring a company’s sales force based on cost savings, minimizing disruption to past account relationships, and constructing a balanced and practical alignment
- Established models for accurate, fair, and motivational sales goals for a 300 person sales force
- Created and maintained an online portal to assist target planning by tracking account information

IES Abroad Intern Spring 2009

Office of International Relations, Siena, Italy

- Translated official documents from Italian into English and Russian
- Provided guidance to foreign students and processed study abroad applications for Italian students

Program Assistant & Resident Advisor, Internship for Building Community *Summer 2008*
Columbia University, New York, NY, USA

- Graded assignments and led class discussions as teaching assistant for two thirty-student classes
- Assisted development of student community and led trips around New York for high school students
- Oversaw and provided daily guidance for eight resident students

**SELECTED
HONORS AND
AWARDS**

Honorable Mention Poster Prize at the Mixed Integer Programming Workshop 2016	<i>2016</i>
Most Visionary Paper Award for “Small Representations of Big Kidney Exchange Graphs” (with Dickerson, Procaccia, and Sandholm) at the EXPLORE Workshop at AAMAS 2016	<i>2016</i>
Best Poster Prize at the Mixed Integer Programming Workshop 2014	<i>2014</i>
Student Travel Support Award at the Mixed Integer Programming Workshop 2014	<i>2014</i>
Zoltners Fellowship	<i>2011–2013</i>
William Larimer Mellon Fellowship	<i>2011–2016</i>
Omega Rho Honor Society	<i>2010</i>
Engineering Global Fellow	<i>2009</i>
Robert C. Byrd Scholarship	<i>2007</i>
The New York State Society of Professional Engineers Scholarship	<i>2007</i>
Toshiba ExploraVision National Competition Honorable Mention	<i>2004</i>

SERVICE

General Chair: YinzOR Student Conference (2017)	
Program Committee: AI ³ Workshop (2018), EXPLORE Workshop at AAMAS (2017)	
Reviewer: Mathematical Programming Computation (2016), CPAIOR (2015)	
INFORMS Education Outreach Committee	<i>2018</i>
INFORMS Annual Meeting, Session Chair	<i>2017</i>
INFORMS Student Affairs Committee	<i>2016–2018</i>
INFORMS Chapters/Fora Committee	<i>2016</i>
INFORMS Subdivision Council, Student Chapter Representative	<i>2015–2016</i>
• Subcommittees: Diversity (2015), INFORMS Connect (2016), Chapter Health (2016)	
ISMP Conference in Pittsburgh, PA, Session Chair	<i>2015</i>
ISMP Conference in Pittsburgh, PA, Volunteer	<i>2015</i>
CMU INFORMS Student Chapter, Founder	
• President (2014–2015), Consulting Board (2015–2018)	
• INFORMS Chapter Award: Magna Cum Laude Recognition	<i>2017</i>
• INFORMS Chapter Award: Summa Cum Laude Recognition	<i>2016</i>
Cornell Omega Rho Honor Society, President	<i>2010–2011</i>
Net Impact Conference at Cornell University, Volunteer	<i>2009</i>
Cornell Jewish-Russian Club, Treasurer	<i>2008–2011</i>

OTHER

Technical Skills: C++, Java, Matlab, Mathematica, Python, Excel RiskSolver, AMPL, C, R

Languages: Fluent in English, native speaker in Russian, advanced in Italian, beginner in French

Professional Societies: INFORMS, MOS

Citizenship: USA

REFERENCES

Egon Balas
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François Margot
fmargot11@gmail.com

Ariel Procaccia
arielpro@cs.cmu.edu