

JOEY HUCHETTE

Operations Research Center
 Massachusetts Institute of Technology
 77 Massachusetts Avenue
 Cambridge, MA 02139

(703) 310-9323 📞
 joehuchette 🌐
 joehuchette@gmail.com ✉️
<https://joehuchette.github.io> 🌐

Interests Integer programming, operations research, nonconvex optimization, computational optimization, software for optimization and decision-making

Experience **Google**, Cambridge, MA
 Postdoctoral researcher in the Operations Research group July 2018 – present

Akamai Technologies, Cambridge, MA
 Data Science Intern June 2016 – August 2016

Argonne National Laboratory, Lemont, IL
 Visiting Researcher June 2014

Lawrence Berkeley National Laboratory, Berkeley, CA
 SULI Research Intern at NERSC June 2012 – August 2012

Education **Massachusetts Institute of Technology**, Cambridge, MA
 PhD in Operations Research September 2013 – June 2018
 Advisor: Prof. Juan Pablo Vielma
 Committee: Prof. Michel X. Goemans, Prof. James B. Orlin, Prof. Juan Pablo Vielma

Rice University, Houston, TX
 B.A. in Computational and Applied Mathematics August 2009 – May 2013
 Cum laude with Distinction in Research

Honors

- 2018 INFORMS Optimization Society Student Paper Prize (Second place) 2018
- MIP Workshop Best Poster Award (honorable mention) 2017
- INFORMS Computing Society Prize 2016
- MIT Operations Research Center Best Student Paper Award 2016
- COIN-OR INFORMS Cup 2015
- NSF Graduate Fellowship 2013 – 2016
- Rice Engineering Alumni Senior Merit Award 2013
- CAAM-Chevron Undergraduate Prize for Research 2012

Papers *Journal articles*

J1. J. Huchette and J. P. Vielma. (2018) *A combinatorial approach for small and strong formulations of disjunctive constraints*. To appear in *Mathematics of Operations Research*.

- Second place in the 2018 INFORMS Optimization Society Student Paper Prize.

J2. I. Dunning, J. Huchette, and M. Lubin. (2017) *JuMP: A modeling language for mathematical optimization*. *SIAM Review*, 59(2) p. 295–320.

- Winner of the 2016 INFORMS Computing Society Prize.

- Co-winner of the 2016 MIT Operations Research Center Best Student Paper Award.
- The work described in this paper received the 2015 COIN-OR INFORMS Cup.

- J3. J. P. Vielma, I. Dunning, J. Huchette, and M. Lubin. (2017) *Extended formulations in mixed integer conic quadratic programming*. *Mathematical Programming Computation*, 9(3) p. 369–418.
- J4. J. Huchette, S. S. Dey, and J. P. Vielma. (2017) *Beating the SDP bound for the floor layout problem: A simple combinatorial idea*. To appear in *INFOR: Information Systems and Operational Research*.
- J5. J. Huchette, S. S. Dey, and J. P. Vielma. (2017) *Strong mixed-integer formulations for the floor layout problem*. To appear in *INFOR: Information Systems and Operational Research*.

Submitted

- S1. J. Huchette and J. P. Vielma. *A mixed-integer branching approach for very small formulations of disjunctive constraints*.
- S2. J. Huchette and J. P. Vielma. *Nonconvex piecewise linear functions: Advanced formulations and simple modeling tools*.
- A preliminary version received an honorable mention for the *Best Poster Award* at the 2017 MIP Workshop.

Conference proceedings

- C1. J. Huchette, M. Lubin, and C. Petra. (2014) *Parallel algebraic modeling for stochastic optimization*. In the proceedings of the *First Workshop for High Performance Technical Computing in Dynamic Languages* (HPTCDL).
- C2. B. Behzad, H. Luu, J. Huchette, S. Byna, R. Aydt, Q. Koziol, and M. Snir. (2013) *Taming parallel I/O complexity with auto-tuning*. In the Proceedings of the *International Conference on High Performance Computing, Networking, Storage and Analysis* (SC13).

Teaching

Massachusetts Institute of Technology, Cambridge, MA

- 15.093 – Integer Programming and Combinatorial Optimization Spring 2018
Guest lecturer (one class) for graduate-level class on integer programming and discrete optimization.
- Software Tools for Business Analytics January 2017
Prepared and taught a three-hour session on basic optimization modeling and software. Targeted at undergraduate students in business with no prerequisite knowledge in optimization.
- 15.S60 – Computing in Optimization and Statistics January 2017
Co-taught a three-hour session on basic linear optimization software and techniques. Targeted at graduate students in operations research.
- 15.093J – Optimization Methods Fall 2016
Guest lecturer (two classes) for masters-level class on mathematical optimization.
- 15.083J – Integer Programming and Combinatorial Optimization Spring 2016
Teaching assistant for graduate-level class on integer programming and discrete optimization.

- 15.S60 – Software Tools for Operations Research January 2016
- 15.S60 – Software Tools for Operations Research January 2015
- Organized a month-long class (8 sessions) covering software tools and methodologies relevant for operations research.
- Taught one three-hour session on advanced (mixed-integer) optimization software and techniques. Targeted at graduate students in operations research.
- 15.081J – Introduction to Mathematical Programming Fall 2014
- 15.093J – Optimization Methods Fall 2014
- 15.083J – Integer Programming and Combinatorial Optimization Fall 2014
- Co-taught a total of six recitation sessions on JuMP and optimization software in Julia.

Rice University, Houston, TX

- CAAM 335 - Matrix Analysis Spring 2011
- Grader for weekly homework assignments and midterm and final exams.

Presentations *A mixed-integer branching approach for very small formulations of disjunctive constraints.*

- ISMP July 2018

Systematically building mixed-integer programming formulations using JuMP and Julia.

- JuMP Developers Workshop June 2018
- INFORMS Annual Meeting (*upcoming*) November 2018

Advanced Mixed Integer Programming Formulation Techniques.

- ISCO (two day spring school, joint with J. P. Vielma) April 2018

Nonconvex piecewise linear functions: Advanced formulations and simple modeling tools.

- Google NYC, Algorithms Seminar September 2018
- INFORMS Optimization Society Conference March 2018
- INFORMS Annual Meeting October 2017
- MIP Workshop (poster) June 2017

Advanced mixed-integer programming formulations: Methodology, computation, and application.

- Argonne National Laboratory, Mathematics and Computer Science Division February 2018
- Cornell University, School of Operations Research and Information Engineering January 2018
- Rice University, Department of Computational and Applied Mathematics January 2018
- University of Toronto, Department of Mechanical and Industrial Engineering January 2018
- Cornell Young Researchers Workshop October 2017

PiecewiseLinearOpt.jl: Solving optimization problems containing piecewise linear functions.

- JuMP Developers Workshop June 2017

Mixed-integer sum of squares optimization: Computation and application.

- SIAM Conference on Optimization May 2017

A combinatorial approach for small and strong formulations of disjunctive constraints.

- INFORMS Annual Meeting November 2016
- MIP Workshop (poster) May 2016

Strong mixed-integer formulations for the floor layout problem.

- INFORMS Annual Meeting November 2015
- Argonne National Laboratory, LANS Seminar August 2015
- ISMP July 2015
- MIP Workshop (poster) June 2015
- INFORMS Annual Meeting November 2014
- MIP Workshop (poster) July 2014

Modeling optimization problems with JuMP in Julia.

- Carnegie Mellon, Tepper School of Business (joint with M. Lubin) March 2015
- Georgia Tech, DOS Seminar November 2014
- UC Berkeley, Mechanical Engineering (joint with I. Dunning and M. Lubin) November 2014

JuliaOpt - Optimization packages for Julia.

- JuliaCon (workshop, joint with I. Dunning, M. Lubin, and M. Udell) June 2015
- JuliaCon (joint with I. Dunning) June 2014

Service

- Reviews for: *Management Science*, *Mathematical Programming Computation*, *INFORMS Journal on Computing*, *SIAM Journal on Optimization*, *International Conference on Integer Programming and Combinatorial Optimization (IPCO) 2017*, *Computers and Operations Research*, *Computational Optimization and Applications*, *Optimization Letters*.
- JuliaCon (2015) Program Committee
- INFORMS COIN-OR Cup (2016) Committee
- Program Committee, INFORMS Computing Society Conference (2019)
- Local Organizing Committee, MIP Workshop (2019)
- JuMP Steering Committee
- Member of INFORMS and SIAM

Funding

- NSF Graduate Fellowship (2013-2016)
- Student travel support: MIP Workshop (2014, 2015, 2016, 2017)