Juan Pablo Vielma

https://juan-pablo-vielma.github.io/

I Education

Ph.D. in Industrial Engineering, **Georgia Institute of Technology**	2009
Mathematical Engineering Professional Degree (Masters Equivalent), **Universidad de Chile**	2003
Bachelor in Engineering Sciences, Major in Mathematics, **Universidad de Chile**	2003

II Employment

Google Research, Operations Research Group,	
Research Scientist	July, 2020 – Present
Visiting Researcher	July, 2019 – June, 2020
Massachusetts Institute of Technology, Sloan School of Management,	
Research Scientist (3% effort)	July, 2020 – Present
Richard S. Leghorn (1939) Career Development Associate Professor	July, 2017 – June, 2020
Richard S. Leghorn (1939) Career Development Assistant Professor	September, 2013 – June, 2017
Assistant Professor	July, 2012 – August, 2013
University of Pittsburgh, Department of Industrial Engineering,	
Assistant Professor	September, 2010 – June, 2012
Visiting Assistant Professor	September, 2009 – August, 2010
IBM Research, Thomas J. Watson Research Center,	
Postdoctoral Fellow	August, 2009 – August, 2010
ILOG, Inc., CPLEX R&D,	
Summer Intern	Summer, 2006

III Research Awards and Fellowships

INFORMS Computing Society (ICS) Prize	October, 2017
Presidential Early Career Award for Scientists and Engineers (PECASE)	January, 2017
First prize in the INFORMS Junior Faculty Interest Group Paper Competition	November, 2015
INFORMS Section on Energy, Natural Resources, and the Environment Best Publication Award in Natural Resources	October, 2015
CAREER Award, National Science Foundation	February, 2014
Second prize in the INFORMS Junior Faculty Interest Group Paper Competition	October, 2013
Finalist for the INFORMS Junior Faculty Interest Group Paper Competition	November, 2011
Finalist for the INFORMS Junior Faculty Interest Group Paper Competition	November, 2010
IBM Herman Goldstine Postdoctoral Fellowship	August, 2009
INFORMS Optimization Society Student Paper Prize	November, 2007
John Morris Fellowship, H. Milton Stewart School of Industrial & Systems Engineering, Georgia Institute of Technology	2004 – 2008
Academic Excellency Scholarship. School of Engineering Sciences, Universidad de Chile	1996
Bronze Medal, Chilean National Mathematics Olympiad	1995

IV Publications

Refereed Journal Articles (Selected)

J-1 *"Conic optimization with spectral functions on Euclidean Jordan algebras"*. C. Coey, L. Kapelevich and J. P. Vielma. To appear in **Mathematics of Operations Research**, 2022.

J-2 *"Performance enhancements for a generic conic interior point algorithm"*. C. Coey, L. Kapelevich and J. P. Vielma. To appear in **Mathematical Programming Computation**, 2022.

J-3 *"Computing conjugate barrier information for nonsymmetric cones"*. L. Kapelevich, E. D. Andersen and J. P. Vielma. To appear in **Journal of Optimization Theory and Applications**, 2022.

J-4 *"Sum of squares generalizations for conic sets"*. L. Kapelevich, C. Coey and J. P. Vielma. To appear in **Mathematical Programming**, 2022.

J-5 *"Solving natural conic formulations with Hypatia.jl"*. C. Coey, L. Kapelevich and J. P. Vielma. To appear in **INFORMS Journal on Computing**, 2022.

J-6 *"Disjunctive cuts for mixed-integer conic optimization"*. A. Lodi, M. Tanneau and J. P. Vielma. To appear in **Mathematical Programming**, 2022.

J-7 *"Nonconvex piecewise linear functions: Advanced formulations and simple modeling tools"*. J. Huchette and J. P. Vielma. To appear in **Operations Research**, 2022.

J-8 *"Mixed-integer convex representability"*. M. Lubin, J. P. Vielma and I. Zadik. **Mathematics of Operations Research** 47, 2021. pp. 720–749.

J-9 *"Strong mixed-integer programming formulations for trained neural networks"*. R. Anderson, J. Huchette, W. Ma, C. Tjandraatmadja and J. P. Vielma. **Mathematical Programming** 183, 2020. pp. 3–39.

J-10 *"Outer approximation with conic certificates for mixed-integer convex problems"*. C. Coey, M. Lubin and J. P. Vielma. **Mathematical Programming Computation** 12, 2020. pp. 249–293.

J-11 *"Learning in combinatorial optimization: what and how to explore"*. S. Modaresi, D. Saure and J. P. Vielma. **Operations Research** 68, 2020. pp. 1285–1624.

- 2013 INFORMS JFIG Paper Competition, Second Prize

J-12 *"Ellipsoidal methods for adaptive choice-based conjoint analysis"*. D. Saure and J. P. Vielma. **Operations Research** 67, 2019. pp. 295–597.

J-13 *"A combinatorial approach for small and strong formulations of disjunctive constraints"*. J. Huchette and J. P. Vielma. **Mathematics of Operations Research** 44, 2019. pp. 767–1144.

J-14 *"Small and strong formulations for unions of convex sets from the Cayley Embedding"*. J. P. Vielma. **Mathematical Programming** 177, 2019. pp. 21–53.

J-15 *"Embedding Formulations and Complexity for Unions of Polyhedra"*. J. P. Vielma. **Management Science** 64, 2018. pp. 4721–4734.

- 2015 INFORMS JFIG Paper Competition, First Prize
- 2017 INFORMS Computing Society (ICS) Prize

J-16 *"Polyhedral approximation in mixed-integer convex optimization"*. M. Lubin, E. Yamangil, R. Bent and J. P. Vielma. **Mathematical Programming** 172, 2018. pp. 139–168.

J-17 *"Extended formulations in mixed integer conic quadratic programming"*. J. P. Vielma, I. Dunning, J. Huchette and M. Lubin. **Mathematical Programming Computation** 9, 2017. pp. 369–418.

- Cone disaggregation technique in this paper has been adopted by CPLEX v12.6.2, Gurobi v6.5, SCIP v4.0 and Xpress v8.0

J-18 *"Convex hull of two quadratic or a conic quadratic and a quadratic inequality"*. S. Modaresi and J. P. Vielma. **Mathematical Programming** 164, 2017. pp. 383–409.

J-19 *"Intersection cuts for nonlinear integer programming: convexification techniques for structured sets"*. S. Modaresi, M. R. Kılınç and J. P. Vielma. **Mathematical Programming** 155, 2016. pp. 575–611.

J-20 *"Mixed integer linear programming formulation techniques"*. J. P. Vielma. **SIAM Review** 57, 2015. pp. 3–57.

J-21 *"On the Chvátal-Gomory closure of a compact convex set"*. D. Dadush, S. S. Dey and J. P. Vielma. **Mathematical Programming** 145, 2014. pp. 327–348.

- 2011 INFORMS JFIG Paper Competition, Finalist

J-22 *"Imposing connectivity constraints in forest planning models"*. R. Carvajal, M. Constantino, M. Goycoolea, J. P. Vielma and A. Weintraub. **Operations Research** 61, 2013. pp. 824–836.

- 2015 Best Publication Award in Natural Resources, INFORMS Section on Energy, Natural Resources, and the Environment

J-23 *"Strong dual for conic mixed-integer programs"*. D. Morán, S. S. Dey and J. P. Vielma. **SIAM Journal on Optimization** 22, 2012. pp. 1136–1150.

J-24 *"The Chvátal-Gomory closure of a strictly convex body"*. D. Dadush, S. S. Dey and J. P. Vielma. **Mathematics of Operations Research** 36, 2011. pp. 227–239.

- 2010 INFORMS JFIG Paper Competition, Finalist

J-25 *"Modeling disjunctive constraints with a logarithmic number of binary variables and constraints"*. J. P. Vielma and G. Nemhauser. **Mathematical Programming** 128, 2011. pp. 49–72.

- 2017 INFORMS Computing Society (ICS) Prize

J-26 *"Mixed-integer models for nonseparable piecewise linear optimization: unifying framework and extensions"*. J. P. Vielma, S. Ahmed and G. Nemhauser. **Operations Research** 58, 2010. pp. 303–315.

- 2017 INFORMS Computing Society (ICS) Prize

J-27 *"A lifted linear programming branch-and-bound algorithm for mixed integer conic quadratic programs"*. J. P. Vielma, S. Ahmed and G. Nemhauser. **INFORMS Journal on Computing** 20, 2008. pp. 438–450.

- 2007 INFORMS Optimization Society Student Paper Prize

Refereed Journal Articles (Other)

J-28 *"Building representative matched samples with multi-valued treatments in large observational studies"*. M. Bennett, J. P. Vielma and J. R. Zubizarreta. **Journal of Computational and Graphical Statistics** 29, 2020. pp. 744–757.

J-29 *"A geometric way to build strong mixed-integer programming formulations"*. J. Huchette and J. P. Vielma. **Operations Research Letters** 47, 2019. pp. 601–606.

J-30 *"Strong mixed-integer formulations for the floor layout problem"*. J. Huchette, S. S. Dey and J. P. Vielma. **INFOR: Information Systems and Operational Research** 56, 2018. pp. 392–433.

J-31 *"Beating the SDP bound for the floor layout problem: A simple combinatorial idea"*. J. Huchette, S. S. Dey and J. P. Vielma. **INFOR: Information Systems and Operational Research** 56, 2018. pp. 457–481.

J-32 *"On packing and covering polyhedra in infinite dimensions"*. L. Rademacher, A. Toriello and J. P. Vielma. **Operations Research Letters** 44, 2016. pp. 225–230.

J-33 *"Split cuts and extended formulations for mixed integer conic quadratic programming"*. S. Modaresi, M. R. Kılınç and J. P. Vielma. **Operations Research Letters** 43, 2015. pp. 10–15.

J-34 *"Solution strategies to the stochastic design of mineral flotation plants"*. N. E. Jamett, L. A. Cisternas and J. P. Vielma. **Chemical Engineering Science** 134, 2015. pp. 850–860.

J-35 *"Restricted risk measures and robust optimization"*. G. Lagos, D. Espinoza, E. Moreno and J. P. Vielma. **European Journal of Operational Research** 241, 2015. pp. 771–782.

J-36 *"Computational experiments with cross and crooked cross cuts"*. S. Dash, O. Günlük and J. P. Vielma. **INFORMS Journal on Computing** 26, 2014. pp. 780–797.

J-37 *"Incremental and encoding formulations for mixed integer programming"*. S. Yıldız and J. P. Vielma. **Operations Research Letters** 41, 2013. pp. 654–658.

J-38 *"Mixed integer linear programming formulations for probabilistic constraints"*. J. P. Vielma, S. Ahmed and G. Nemhauser. **Operations Research Letters** 40, 2012. pp. 153–158.

J-39 *"Fitting piecewise linear continuous functions"*. A. Toriello and J. P. Vielma. **European Journal of Operational Research** 219, 2012. pp. 86–95.

J-40 *"An integer linear programming approach for bilinear integer programming"*. A. S. Freire, E. Moreno and J. P. Vielma. **Operations Research Letters** 40, 2012. pp. 74–77.

J-41 *"The split closure of a strictly convex body"*. D. Dadush, S. S. Dey and J. P. Vielma. **Operations Research Letters** 39, 2011. pp. 121–126.

J-42 *"A note on 'A superior representation method for piecewise linear functions' "*. J. P. Vielma, S. Ahmed and G. Nemhauser. **INFORMS Journal on Computing** 22, 2010. pp. 493–497.

J-43 *"Evaluating alternative approaches for solving the area restriction model in harvest scheduling"*. M. Goycoolea, A. Murray, J. P. Vielma and A. Weintraub. **Forest Science** 55, 2009. pp. 149–165.

J-44 *"Nonconvex, lower semicontinuous piecewise linear optimization"*. J. P. Vielma, A. Keha and G. Nemhauser. **Discrete Optimization** 5, 2008. pp. 467–488.

J-45 *"A constructive characterization of the split closure of a mixed integer linear program"*. J. P. Vielma. **Operations Research Letters** 35, 2007. pp. 29–35.

J-46 *"Improving computational capabilities for addressing volume constraints in forest harvest scheduling problems"*. J. P. Vielma, A. Murray, D. Ryan and A. Weintraub. **European Journal of Operational Research** 176, 2007. pp. 1246–1264.

Articles in Refereed Conference Proceedings

P-1 *"Constrained discrete black-box optimization using mixed-integer programming"*. T. P. Papalexopoulos, C. Tjandraatmadja, R. Anderson, J. P. Vielma and D. Belanger. In K. Chaudhuri and S. Jegelka and L. Song and C. Szepesvaria and G. Niu and S. Sabato, editors, Proceedings of the 39th International Conference on Machine Learning (**ICML 2022**), Proceedings of Machine Learning Research 162, 2022. pp. 17295–17322.

P-2 *"The Convex Relaxation Barrier, Revisited: Tightened Single-Neuron Relaxations for Neural Network Verification"*. C. Tjandraatmadja, R. Anderson, J. Huchette, W. Ma, K. Patel and J. P. Vielma. In H. Larochelle and M. Ranzato and R. Hadsell and M.F. Balcan and H. Lin, editors, Proceedings of the 34th Conference on Neural Information Processing Systems (**NeurIPS 2020**), Advances in Neural Information Processing Systems 33, 2020. pp. 21675–21686.

P-3 *"Strong mixed-integer programming formulations for trained neural networks"*. R. Anderson, J. Huchette, C. Tjandraatmadja and J. P. Vielma. In A. Lodi and V. Nagarajan, editors, Proceedings of the 20th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2019**), Lecture Notes in Computer Science 11480, 2019. pp. 27–42.

P-4 *"Dynamic automatic differentiation of GPU broadcast kernels"*. J. Revels, T. Besard, V. Churavy, B. De Sutter and J. P. Vielma. In Proceedings of the Workshop on Systems for ML and Open Source Software at NeurIPS 2018 (**NeurIPS MLSys 2018**), 2018.

P-5 *"Mixed-integer convex representability"*. M. Lubin, I. Zadik and J. P. Vielma. In F. Eisenbrand and J. Könemann, editors, Proceedings of the 19th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2017**), Lecture Notes in Computer Science 10328, 2017. pp. 392–404.

P-6 *"Extended formulations in mixed-integer convex programming"*. M. Lubin, E. Yamangil, R. Bent and J. P. Vielma. In Q. Louveaux and M. Skutella, editors, Proceedings of the 18th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2016**), Lecture Notes in Computer Science 9682, 2016. pp. 102–113.

P-7 *"Risk averse approaches in open-pit production planning under ore grade uncertainty: a ultimate pit study"*. D. Espinoza, G. Lagos, E. Moreno and J. P. Vielma. In J. F. Costa, J. Koppe and R. Peroni, editors, Proceedings of the 36th International Symposium on Application of Computers and Operations Research in The Mineral Industry (**APCOM 2013**), 2013. pp. 492–501.

P-8 *"On the Chvátal-Gomory closure of a compact convex set"*. D. Dadush, S. S. Dey and J. P. Vielma. In O. Günlük and G. J. Woeginger, editors, Proceedings of the 15th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2011**), Lecture Notes in Computer Science 6655, 2011. pp. 130–142.

P-9 *"The Chvátal-Gomory closure of an ellipsoid is a polyhedron"*. S. S. Dey and J. P. Vielma. In F. Eisenbrand and F. B. Shepherd, editors, Proceedings of the 14th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2010**), Lecture Notes in Computer Science 6080, 2010. pp. 327–340.

P-10 *"Risk control in ultimate pits using conditional simulations"*. J. P. Vielma, D. Espinoza and E. Moreno. In Proceedings of the 34th International Symposium on Application of Computers and Operations Research in The Mineral Industry (**APCOM 2009**), 2009. pp. 107–114.

P-11 *"Modeling disjunctive constraints with a logarithmic number of binary variables and constraints"*. J. P. Vielma and G. Nemhauser. In A. Lodi, A. Panconesi and G. Rinaldi, editors, Proceedings of the 13th Conference on Integer Programming and Combinatorial Optimization (**IPCO 2008**), Lecture Notes in Computer Science 5035, 2008. pp. 199–213.

P-12 *"Improved solution techniques for multi-period area-based forest harvest scheduling problems"*. J. P. Vielma, A. Murray, D. Ryan and A. Weintraub. In M. Bevers and T.M. Barrett, editors, Proceedings of the 10th Symposium for Systems Analysis in Forest Resources (**SSAFR'03**), USDA Forest Services General Technical Report PNW-GTR-656, 2005. pp. 285–290.

Articles in Non-Refereed Conference Proceedings

N-1 *"Design of flotation circuits including uncertainty and water efficiency"*. N. E. Jamett, J. P. Vielma and L. A. Cisternas. In I. D. Lockhart Bogle and M. Fairweather, editors, Proceedings of the 22nd European Symposium on Computer Aided Process Engineering (**Escape 22**), Computer-Aided Chemical Engineering 30, 2012. pp. 1277–1281.

N-2 *"Comparing alternative formulations for the ARM"*. J. P. Vielma, M. Goycoolea, A. Murray and A. Weintraub. To appear in In Proceedings of the 12th Symposium for Systems Analysis in Forest Resources (**SSAFR'06**), 2006.

N-3 *"Improved solution techniques for multi-period area-based forest harvest scheduling problems"*. J. P. Vielma, A. Murray, D. Ryan and A. Weintraub. In Proceedings of the 38th Annual Conference of the Operational Research Society of New Zealand (**ORSNZ'03**), 2003. pp. 21–28.

Papers/Articles in Progress or Under Review

S-1 *"JuMP 1.0"*. M. Lubin, O. Dowson, J. D. Garcia, J. Huchette, B. Legat and J. P. Vielma. Submitted for publication, 2022.

S-2 *"Shapes and recession cones in mixed-integer convex representability"*. I. Zadik, M. Lubin and J. P. Vielma. Submitted for publication, 2021.

Technical Reports

E-1 *"designmatch: Matched samples that are balanced and representative by design"*. J. R. Zubizarreta, Ç. Kılcıoğlu and J. P. Vielma. Technical Report, 2018.

E-2 *"A mixed-integer branching approach for very small formulations of disjunctive constraints"*. J. Huchette and J. P. Vielma. Technical Report, 2017.

E-3 *"Predicting performance under stressful conditions using galvanic skin response"*. C. Mundell, J. P. Vielma and T. Zaman. Technical Report, 2016.

E-4 *"Picking winners in daily fantasy sports using integer programming"*. D. S. Hunter , J. P. Vielma and T. Zaman. Submitted for publication, 2016.

E-5 *"Two-sided linear chance constraints and extensions"*. M. Lubin, D. Bienstock and J. P. Vielma. Technical Report, 2016.

E-6 *"Strategic timing of content in online social networks"*. S. Modaresi, J. P. Vielma and T. Zaman. Technical Report, 2015.

Theses

T-1 *"Mixed integer programming approaches for nonlinear and stochastic programming"*. J. P. Vielma. Ph.D. Thesis, H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA, 2009.

T-2 *"Restricciones de volumen elásticas para un problema de planificación forestal con restricciones de área en múltiples períodos"*. J. P. Vielma. Mathematical Engineering Thesis (In Spanish), Department of Mathematical Engineering, University of Chile, Santiago, Chile, 2003.

V Invited Oral Presentations

Details and slides at `https://juan-pablo-vielma.github.io/`

Plenaries, Keynotes and Semi-Plenaries

- 24th International Symposium on Mathematical Programming (ISMP), Aug. 2022 (Semi-plenary).
- INFORMS Optimization Society Conference, Greenville, SC, Mar. 2022.
- JuliaCon 2020, Jul. 2020.
- Symposium for Systems Analysis in Forest Resources (SSAFR), 2011 (Semi-Plenary).

Presentations at Academic Institutions

- University of California at Berkeley (Industrial Engineering and Operations Research Department), Berkeley, CA, Dec. 2019.
- Georgia Institute of Technology (H. Milton Stewart School of Industrial & Systems Engineering), Atlanta, GA, Sep. 2019, Oct. 2015, Nov. 2008, Oct. 2008, Apr. 2008, Feb. 2007 and Oct. 2006.
- UC Davis (Department of Mathematics), Davis, CA, Apr. 2019.
- Universidad Técnica Federico Santa María (Campus Santiago San Joaquín), Santiago, Chile, Mar. 2019.
- Northeastern University (Mechanical and Industrial Engineering Department), Boston, MA, Oct. 2018.
- University of Michigan (Michigan Institute for Computational Discovery & Engineering, and Department of Industrial and Operations Engineering), Ann Arbor, MI, Oct. 2018.
- Cornell University (School of Operations Research and Information Engineering), Ithaca, NY, Nov. 2017 and Jan. 2012.
- University of Chicago (Booth School of Business), Chicago, IL, Oct. 2017.
- Universidad de Valparaíso (Escuela de Ingeniería Civil Biomédica), Valparaíso, Chile, Aug. 2017.
- Pontificia Universidad Católica de Chile (Departamento de Ingeniería Industrial y de Sistemas), Santiago, Chile, Aug. 2017.
- Universidad de Chile (Departamento de Ingeniería Industrial), Santiago, Chile, Aug. 2017 and Dec. 2013.

- Universidad Adolfo Ibañez (Grupo de Ingenierá Industrial e Investigación de Operaciones), Santiago, Chile, Aug. 2017.
- Universidad de Santiago (Departamento de Ingeniería Industrial), Santiago, Chile, Aug. 2017.
- Massachusetts Institute of Technology (Center for Transportation & Logistics), Cambridge, MA, Jun. 2017.
- University of Toronto (Rotman School of Management), Toronto, Canada, Dec. 2016.
- Columbia University (Columbia Business School), New York, NY, Oct. 2016.
- Los Alamos National Laboratory (Center for Nonlinear Studies), Los Alamos, New Mexico, Aug. 2016.
- Massachusetts Institute of Technology (Sloan School of Management), Cambridge, MA, Mar. 2016 and Feb. 2012.
- Columbia University (Department of Industrial Engineering & Operations Research), New York, NY, Sep. 2015.
- Carnegie Mellon University (Tepper School of Business), Pittsburgh, PA, Apr. 2015.
- IBM Thomas J. Watson Research Center, Yorktown Heights, NY, Dec. 2014 and Mar. 2010.
- Universidad Adolfo Ibañez (Escuela de Negocios), Santiago, Chile, Oct. 2013 and Jul. 2008.
- Massachusetts Institute of Technology (Operations Research Center), Cambridge, MA, Dec. 2012.
- Rutgers University (Center for Discrete Mathematics and Theoretical Computer Science), Piscataway, NJ, Nov. 2011.
- Carnegie Mellon University (Department of Chemical Engineering), Pittsburgh, PA, Apr. 2011.
- Universidad de Antofagasta (Departamento de Ingeniería Química), Antofagasta, Chile, Mar. 2011.
- University of Pittsburgh (Department of Industrial Engineering), Pittsburgh, PA, Sep. 2009 and Dec. 2008.
- Georgia Institute of Technology (School of Chemical and Biomolecular Engineering), Atlanta, GA, Mar. 2009.

Presentations at Invited Workshops

- CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming, Montréal, Québec, Canada, Oct. 2019.
- Seminar 18081, Designing and Implementing Algorithms for Mixed-Integer Nonlinear Optimization Schloss Dagstuhl, Leibniz-Zentrum für Informatik, Wadern, Germany, Feb. 2018.
- Seventh Cargese Workshop on Combinatorial Optimization, Institut d'Etudes Scientifiques de Cargèse, Corsica, France, Oct. 2016.
- Workshop in Consumer Analytics, San Pedro de Atacama, Chile, Jan. 2016.
- Modern Techniques in Discrete Optimization: Mathematics, Algorithms and Applications, CMO-BIRS Casa Matemática Oaxaca, Oaxaca, Mexico, Nov. 2015.
- Mixed-integer Nonlinear Optimization: A Hatchery for Modern Mathematics, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, Oct. 2015 (one of the five hour-long focus talks).
- Workshop on Combinatorial Optimization, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany, Nov. 2014 (one of the five hour-long focus talks).
- Mixed Integer Programming Workshop, Madison, WI, Jul. 2013 and Atlanta, GA, Jul. 2010.
- Bellairs Workshop on Combinatorial Optimization, Holetown, Barbados, Apr. 2013 and Mar. 2008.
- Integer Programming Workshop, Valparaiso, Chile, Mar. 2012.

Presentations at Invited Online Seminar Series

- Machine Learning NeEDS Mathematical Optimization, Mar. 2022.

Conference Presentations

- INFORMS Annual Meeting, 2005–2010, 2012, 2015–2019, and 2021.
- International Symposium on Mathematical Programming (ISMP), 2006, 2009, 2012, 2015, and 2018.
- INFORMS Optimization Society Conference, 2008, 2012 and 2018.
- INFORMS Society for Marketing Science Conference, 2017.
- SIAM Conference on Optimization, 2008, 2011, 2014 and 2017.
- Workshop in Management Science, Puerto Varas, Chile, Jan. 2017.
- International Indian Statistical Association Conference, 2016.
- MIT Sloan Sports Analytics Conference, 2016.
- EURO - INFORMS MMXIII, Rome, Italy, Jul. 2013.
- Symposium for Systems Analysis in Forest Resources (SSAFR), 2002 and 2006.
- International Symposium on Application of Computers and Operations Research in The Mineral Industry (APCOM), Vancouver, Canada, Oct. 2009.
- 13th Conference on Conference on Integer Programming and Combinatorial Optimization (IPCO), Bertinoro, Italy, May 2008.
- 38th Annual Conference of the Operational Research Society of New Zealand, Hamilton, New Zealand, Nov. 2003.
- V Chilean Operational Research Conference, Valparaiso, Chile, Sep. 2003.

Media Appearances

- Emol TV, Aug. 2017.
- CNN Dinero, May and Sep. 2017.

Other Presentations

- MIT Club Chile, MIT Sloan Latin America Office and Everis, Santiago, Chile, Aug. 2017.
- Boston Security Analysts Society, Boston, MA, May 2016.

VI Funding

From Federal Sources

National Science Foundation Grant, $3,498,560, OAC-1835443: "Framework: Software: Next-Generation Cyberinfrastructure for Large-Scale Computer-Based Scientific Analysis and Discovery", PI: A. Edelman, co-PI: J. P. Vielma (**$1,740,560**), January, 2019 – December 31, 2023

Office of Naval Research Grant, $303,174, N00014-18-1-2079: "Extended Formulations for Advanced Mixed Integer Convex Optimization", PI: J. P. Vielma, January, 2018 – December, 2020

Lawrence Livermore National Lab Subcontract, $38,000, "Automatic Differentiation", PI: J. P. Vielma, June 2017 – September 2017

National Science Foundation Grant, $400,000, CMMI-1351619: "CAREER: Advanced Mixed Integer Programming Formulations", PI: J. P. Vielma, February 1, 2014 – January 31, 2019

National Science Foundation Grant, $260,000, CMMI-1233441: "Repetitive Combinatorial Optimization with Learning ", PI: D. Saure, co-PI: J. P. Vielma, September 1, 2012 – August 31, 2015

Air Force Office of Scientific Research, Defense University Research Instrumentation Program. $245,286, "CEMOR: Computing Equipment for Military Operations Research at the University of Pittsburgh", PI: O. A. Prokopyev, co-PIs: J. Kharoufeh, L. Maillart, D. Saure, A. Schaefer and J. P. Vielma, June 2012 – May 2013

Office of Naval Research Grant, $55,502, N000141110724: "Crooked Cross Cuts for Linear and Nonlinear Mixed Integer Programming",1 PI: J. P. Vielma, co-PIs: S. Dash and O. Günlük, July 1, 2011 – December 31, 2012

National Science Foundation Grant, $200,000, CMMI-1030662: "Collaborative Research: Fundamentals of Convex Mixed Integer Nonlinear Programming", PI: J. P. Vielma, September 1, 2010 – August 31, 2014

From Other Sources

MIT-Chile UAI Seed Fund, $25,080, "Facilitating The Use Of Advanced Optimization Tools in Chile and UAI", PI: J. P. Viema, co-PIs: D. Moran, R. Carvajal and M. Goycoolea, January, 2018 – August, 2019

MIT-Chile PUC Seed Fund, $25,080, "Facilitating The Use Of Advanced Optimization Tools in Chile, PUC, and USM", PI: J. P. Viema, co-PIs: G. Angulo and V. Albornoz, January, 2018 – August, 2019

MIT Skoltech Next Generation Program, $194,935, "Energy Systems Planning for Government Regulations: New Formulations, Models and Algorithms", MIT PI: J. P. Vielma, Skoltech PI: David Pozo, MIT co-PI: David Gamarnik, Skoltech co-PI: Michael Chertkov, December 2017 – February, 2019

MIT Sloan Junior Faculty Research Assistance Program, $19,800, "Computational Infrastructure for Advanced Mixed Integer Nonlinear Programming", PI: J. P. Vielma, May 2017 – Present

MIT Research Support Committee Award, NEC Corporation Fund for Research in Computers and Communications, $75,000, "Integrating Advanced Optimization and Automatic Differentiation Methods", PI: J. P. Vielma, May 2017 – June 2020

MIT Sloan Latin America Office Seed Funds Program, $25,000, "Use and development of open-source optimization software in Chile and Latin America using the JuMP modelling language", PI: J. P. Vielma, April 2017 – April 2018

MIT Research Support Committee Award, Solomon Buchsbaum Research Fund. $73,129, "The Impact of Wearable Technology on Worker Well-Being and Productivity", co-PIs: J. P. Vielma and T. Zaman, September 2015 – August 2016

MIT Sloan Junior Faculty Research Assistance Program, $20,000, "Making Advanced Optimization Techniques Accessible with JuMP", PI: J. P. Vielma, June 2014 – December 2015

MIT-Chile UAI Seed Fund, $25,050, "Advanced Decomposition Techniques for Non-Linear Optimization", PI: J. P. Viema, co-PIs: M. Goycoolea and E. Moreno, January 1, 2012 – August 31, 2014

MIT Research Support Committee Award, NEC Corporation Fund for Research in Computers and Communications, $75,000, "Real Time Sequential Mixed Integer Linear Programming", PI: J. P. Vielma, September 2012 – August 2013

VII Service

Editorial and Reviewing Activities

Associate Editor for Mathematical Programming	2022–Present
Associate Editor for Mathematical Programming Computation	2022–Present
Associate Editor for Operations Research	2018–Present

Associate Editor for Operations Research Letters — 2014–Present

Member of program committee, 22nd Conference on Integer Programming and Combinatorial Optimization (IPCO XXII), Atlanta, GA — May, 2021

Reviewer, Laboratory Directed Research and Development competition, Los Alamos National Laboratory — 2019

Reviewer, INFORMS Junior Faculty Interest Group (JFIG) Paper Competition — 2018

Reviewer, FONDECYT National Research Funding Competition of the Chilean National Commission for Scientific and Technological Research (CONICYT) — 2010, 2012–2015 and 2018

External evaluator for the creation of the Mathematical and Computational Engineering degree (Título de Ingeniero Civil Matemático y Computacional) at Universidad Católica de Chile — 2018

NSF Reviewer, Operations Engineering — 2017

NSF Panel Member, Operations Research — 2014

Reviewer for Advances in Engineering Software, AIAA Journal of Spacecraft and Rockets, Annals of Operations Research, APCOM, Computers and Chemical Engineering, Computers & Operations Research, Computational Optimization and Applications, Discrete Optimization, European Journal of Operational Research, ICML, INFORMS Journal on Computing, INFORMS Journal on Optimization, IPCO, Journal of Global Optimization, Journal of Optimization Theory and Applications, LAGOS, Mathematics of Operations Research, Mathematical Methods of Operations Research, Mathematical Programming A, Mathematical Programming B, Mathematical Programming Computation, Management Science, Naval Research Logistics, NeurIPS (top 10% of high-scoring reviewers in 2020), Numerical Analysis and Optimization, Operations Research, Operations Research Letters, Optimization Letters, Optimization Methods and Software, OR Spectrum, SIAM Journal on Optimization, and Wiley Encyclopedia of Operations Research and Management Science

Elected Officer Positions

Member of the Board of Directors, INFORMS Computing Society — 2019–2021

Vice-Chair for Integer and Discrete Optimization, INFORMS Optimization Society — October, 2013–October, 2015

Chair, INFORMS Section on Energy, Natural Resources, and the Environment (ENRE) — December, 2010–November, 2012

Chair-Elect, INFORMS Section on Energy, Natural Resources, and the Environment (ENRE) — December, 2008–November, 2010

Committee Membership and Other Administrative or Professional Society Positions

Committee member, MIP 2022 poster competition — May, 2022

INFORMS Diversity, Equity, and Inclusion (DEI) Ambassador — 2021

Sub-org administrator for JuMP under the NumFOCUS umbrella, Google Summer of Code 2019 — February, 2019 – August, 2019

Member of Ad Hoc Committee, INFORMS Optimization Society — October, 2019–November, 2019

Member of JuMP Steering Committee (for NumFocus fiscal sponsorship)	July, 2018–Present
Committee member, Best Presentation in ENRE Sponsored Mining Sessions at the INFORMS annual meeting	November, 2011

Conference Organization

Session chair, INFORMS annual meeting	2010, 2012, 2016, 2018, 2019 and 2021.
Session chair, International Conference on Continuous Optimization (ICCOPT)	August, 2019
Minisymposia organizer, JuliaCon, Baltimore, MD	July, 2019
Chair of local committee, 16th Mixed Integer Programming Workshop (MIP 2019), Cambridge, MA	2018–2019
Co-organizer, JuMP Developers Workshop	June, 2017, June, 2018, and March 2019
Session chair, International Symposium on Mathematical Programming (ISMP)	July, 2015 and July, 2018
Mini-symposium organizer, SIAM Conference on Optimization	May, 2014 and May, 2017
Cluster chair, INFORMS annual meeting	November, 2014 and November, 2015
Member of program committee, JuliaCon	June, 2015
Member of program committee, First Workshop for High Performance Technical Computing in Dynamic Languages New Orleans, LA	November, 2014
Session chair, EURO-INFORMS joint international meeting	July, 2013
Chair of program committee, 9th Mixed Integer Programming Workshop (MIP 2012), Davis, CA	2011–2012
Member of program committee, 8th Mixed Integer Programming Workshop (MIP 2011), Waterloo, ON	2010–2011
Member of program committee, 14th Symposium for Systems Analysis in Forest Resources (SSAFR 2010), Maitencillo, Chile	2010–2011
Co-Chair, ENRE sponsored cluster at ALIO-INFORMS Joint International Meeting, Buenos Aires, Argentina	June, 2010

Massachusetts Institute of Technology

Faculty Director, MIT-Chile Program, MIT International Science and Technology Initiatives (MISTI)	November, 2018–October, 2019
Faculty Selection Board for the MIT Global Partnerships Fund / Latin America	December, 2018
Operations Research Center Qualifying Exam Committee, (Coordinator for the mathematical programming question in 2018)	Fall, 2013–2018
Member of refereeing/judging committee for final projects of LGO program course on optimization (15.066)	Summer, 2018
ORC Seminar Series Faculty Coordinator	Spring, 2014 and Fall, 2017
Operations Research Center General Exam Committee	Spring, 2013–2019

MISTI Global Seed Funds Evaluation Committee	Fall, 2013 and Spring 2017
Operations Research Center Admissions Committee	Spring, 2013 and 2016
Operations Research Center Best Student Paper Award Committee	Summer, 2015
MIT-Chile Club Board of Advisors	December, 2013 – June, 2020

Membership in Professional Societies

Society of Industrial and Applied Mathematicians (SIAM)	2006–Present
Mathematical Optimization Society	2006–Present
Institute for Operations Research and Management Science (INFORMS)	2005–Present

VIII Teaching

Teaching Awards

Teaching with Digital Technology Award Nomination, Office of Digital Learning and Office of the Vice Chancellor, Massachusetts Institute of Technology	May, 2019
"Thank a Teacher" recognition, Center for the Enhancement of Teaching and Learning, Georgia Institute of Technology	Spring, 2008

Massachusetts Institute of Technology

15.060: Data, Models, and Decisions	Fall 2013–2015, 2017–2018
15.083J/6.859J: Integer Programming and Combinatorial Optimization	Spring 2014, 2016 and 2018
15.099: Seminar in Operations Research	Spring 2013 and Spring 2019
15.093J/6.255J: Optimization Methods	Fall 2012

University of Pittsburgh

IE 3088: Integer Programming	Fall 2011
IE 3080: Conic Programming	Fall 2011
IE 3080: Robust Optimization	Fall 2010

Georgia Institute of Technology

ISyE 3133: Engineering Optimization	Spring 2008

Guest Lectures

- Mixed Integer Conic Optimization using Julia and JuMP
  - Pontificia Universidad Católica de Chile. ICS2121, Métodos de Optimización. March, 2019.
- Mathematical Optimization using JuMP
  - Massachusetts Institute of Technology. 18.337/6.338, Modern Numerical Computing. Fall, 2018.
- Modeling and Solving Discrete Optimization Problems in Practice
  - Massachusetts Institute of Technology. 18.095, Mathematics Lecture Series. IAP, 2018.
- Mixed Integer Programming for Daily Fantasy Sports, Statistics and Marketing
  - Massachusetts Institute of Technology. 15.093J/6.255J, Optimization Methods. Fall, 2016.

  - Harvard University. AM/ES 121, Introduction to Optimization: Models and Methods. Fall, 2016.
- Advanced Mixed Integer Programming Formulation Techniques
  - Pontificia Universidad Católica de Chile. ICS3143, Integer Programming. Summer, 2017.
  - Columbia University. B9124, Causal Inference. Fall, 2016.
- Winning at Daily Fantasy Hockey Using Analytics (together with Tauhid Zaman)
  - Massachusetts Institute of Technology. 15.071, The Analytics Edge. Spring, 2016.

Short Courses and Schools

- Mixed Integer Conic Optimization using Julia and JuMP. Los Alamos National Laboratory's (LANL) 3rd Grid Science Winter School and Conference, Santa Fe, NM, January 2019.
- Advanced Mixed Integer Programming Formulation Techniques (with Joey Huchette). Spring School of the International Symposium on Combinatorial Optimization (ISCO 2018), Marrakesh, Morocco, April 2018.
- MI(N)LP formulations in Julia. Summer School of the 18th Conference on Integer Programming and Combinatorial Optimization (IPCO 2016), Université de Liège, Liège, Belgium, May 2016.
- Advanced Mixed Integer Programming Modelling (in Spanish). Departamento de Ingeniería Química y Procesos de Minerales, Universidad de Antofagasta, Antofagasta, Chile, March 2011.

Software Tutorials and Demonstrations

- Julia and JuMP Tutorial for the Third Annual JuMP Developers Workshop, Instituto Chileno Norteamericano, Santiago, Chile, and Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile (with Oscar Dowson), March, 2019.
- The JuMP Ecosystem for Mathematical Optimization. JuliaCon 2018, University College London, London, UK, August, 2018.
- JuMP Demonstration. Seminar 18081, Designing and Implementing Algorithms for Mixed-Integer Nonlinear Optimization Schloss Dagstuhl, Leibniz-Zentrum für Informatik, Wadern, Germany, February, 2018.

IX Thesis Supervision

Doctoral Theses Supervised

Chris Coey, *Interior point and outer approximation methods for conic optimization*,
Ph.D. in Operations Research, Massachusetts Institute of Technology — May, 2022

Lea Kapelevich, *Techniques for handling nonsymmetric cones in interior point algorithms*,
Ph.D. in Operations Research, Massachusetts Institute of Technology — May, 2022

Nestor A. Sepulveda, *Decarbonization of Power Systems, Multi-Stage Decision-Making with Policy and Technology Uncertainty*,
Department of Nuclear Science and Engineering, Massachusetts Institute of Technology,
Co-supervised with Christopher Knittel and Richard K. Lester — May, 2020

Joey Huchette, *Advanced mixed-integer programming formulations: Methodology, computation, and application*,
Ph.D. in Operations Research, Massachusetts Institute of Technology — June, 2018

Miles Lubin, *Mixed-integer convex optimization: outer approximation algorithms and modeling power*,
Ph.D. in Operations Research, Massachusetts Institute of Technology — June, 2017

Sina Modaresi, *Valid Inequalities and Reformulation Techniques for Mixed Integer Nonlinear Programming*,
Ph.D. in Industrial Engineering, University of Pittsburgh — November, 2015

Master's Theses Supervised

Katherine Burnham, *Information Fusion for an Unmanned Underwater Vehicle through Probabilistic Prediction and Optimal Matching*,
M.S. in Operations Research, Massachusetts Institute of Technology,
Co-supervised with Michael J. Ricard — June, 2020

Hans Kobor, *Closed Loop Supply Chain Waste Reduction Through Predictive Modelling and Process Analysis*,
M.B.A. and M.S. in Mechanical Engineering, Massachusetts Institute of Technology,
Co-supervised with Duane Boning — June, 2019

Austin Herrling, *Optimization of Micro-Coaxial Wire Routing in Complex Microelectronic Systems*,
M.S. in Operations Research, Massachusetts Institute of Technology,
Co-supervised with Michael J. Ricard — June, 2018

Lee Carter Mundell, *Predicting Performance Using Galvanic Skin Response*,
M.S. in Operations Research, Massachusetts Institute of Technology,
Co-supervised with Tauhid Zaman — June, 2016

Paul Baxter, *Automation Techniques for Short Interval Scheduling in a Complex Manufacturing Environment*,
M.B.A. and M.S. in Aeronautics and Astronautics, Massachusetts Institute of Technology,
Co-supervised with Olivier de Weck — June, 2016

Alberto Luna, *Characterizing and Improving the Service Level Agreement at Amazon*,
M.B.A. and M.S. in Engineering Systems, Massachusetts Institute of Technology,
Co-supervised with Bruce Cameron — June, 2015

Paul W. Meggs, *A Systematic Approach to Internal Spare Parts Management*,
M.B.A. and M.S. in Engineering Systems, Massachusetts Institute of Technology,
Co-supervised with Bruce Cameron — June, 2014

Doctoral Committees

Felipe Serrano Musalem, *On Cutting Planes for Mixed-Integer Nonlinear Programming*,
Mathematik und Naturwissenschaften, Technische Universität Berlin — August, 2020

Konstantina Mellou, *Resource Scheduling and Optimization in Dynamic and Complex Transportation Settings*,
Operations Research Center, Massachusetts Institute of Technology — June, 2019

Caroline J. Nielsen, *Optimal Industrial Symbiosis for the Jorf Lasfar Platform* (Proposal)
Department of Chemical Engineering, Massachusetts Institute of Technology — July, 2018

Virgile Galle, *Optimization Models and Methods for Storage Yard Operations in Maritime Container Terminals*,
Operations Research Center, Massachusetts Institute of Technology — December, 2017

Gonzalo Muñoz, *Integer programming techniques for Polynomial Optimization*,
Department of Industrial Engineering and Operations Research, Columbia University — July, 2017

Nikita Korolko, *A Robust Optimization Approach to Online Problems*,
Operations Research Center, Massachusetts Institute of Technology — May, 2017

Iain Dunning, *Advances in Robust and Adaptive Optimization: Algorithms, Software, and Insights*,
Operations Research Center, Massachusetts Institute of Technology — June, 2016

Diego Morán, *Fundamental Properties of Convex Mixed-Integer Programs*,
H. Milton Stewart School of Industrial and Systems Engineering,
Georgia Institute of Technology — May, 2014

Sumit Mitra, *Multi-scale Demand-Side Management for Continuous Power-intensive Processes*,
Chemical Engineering Department, Carnegie Mellon University — April 2013

Sakine Batun, *Scheduling Multiple Operating Rooms Under Uncertainty*,
Department of Industrial Engineering, University of Pittsburgh — November, 2011

Osman Y. Özaltın, *Optimal Design of the Annual Influenza Vaccine*,
Department of Industrial Engineering, University of Pittsburgh — July, 2011

Sebastian Terrazas Moreno, *Decomposition Strategies for the Optimal Design of Integrated Sites and Milti-Site Planning and Scheduling*,
Chemical Engineering Department, Carnegie Mellon University — April, 2011

Andrew C. Trapp, *On Solving Selected Nonlinear Integer Programming Problems in Data Mining, Computational Biology, and Sustainability*,
Department of Industrial Engineering, University of Pittsburgh — March, 2011

Other Supervision Activities

Post-Doctoral Fellows Supervised

Nestor A. Sepulveda, Co-supervised with R. K. Lester at MIT — June 2020–September 2020

Mustafa R. Kılınç, Co-supervised with A. Schaefer at University of Pittsburgh — April 2011–August 2013

Other Long-Term Supervision Activities

Jarrett Revels, Sponsored Research Technical Staff at MIT — May 2017–February, 2019

Student Awards by Students or Co-Authors

Magdalena Bennett, International Biometric Society Eastern North American Region's (ENAR) Distinguished Student Paper Award — March, 2019

Joey Huchette, INFORMS Optimization Society Student Paper Prize (2nd Prize) — November, 2018

Diego Morán, INFORMS Optimization Society Student Paper Prize — October, 2012

Daniel Dadush, INFORMS Optimization Society Student Paper Prize — November, 2011

Other

Gabriel Zamora, member of Masters thesis committee,
Universidad Técnica Federico Santa María — November, 2020.

Mathieu Tanneau, visiting Ph.D. student from Polytechnique Montréal, host at MIT — June–August, 2019

Ivan Zorin, visiting Ph.D. student from Skolkovo Institute of Science and Technology, host at MIT — January–February, 2019

Quentin Lété, visiting Masters student from Université Catholique de Louvain, host at MIT — July–August, 2017

Orlando Rivera, visiting Masters student from Universidad Adolfo Ibañez, host at MIT — February, 2014

Gonzalo Muñoz, visiting Masters student from University of Chile, host at University of Pittsburgh — November, 2011

Nathalie Jamett Guillier, member of Qualifying Exam Committee for Ph.D. in Minerals Processing, Department of Chemical Engineering, University of Antofagasta — June, 2011

Guido Lagos, visiting Masters student from University of Chile, host at University of Pittsburgh — April 2011