

Ryan Cory-Wright

PHD CANDIDATE · OPERATIONS RESEARCH CENTER-MIT

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Education

Massachusetts Institute of Technology

Cambridge, MA

PHD IN OPERATIONS RESEARCH

May 2022 (expected)

Advisor: Dimitris Bertsimas | GPA: 5.0/5.0

Selected Coursework: Optimization (Linear, Integer, Robust, Semidefinite), Statistical Learning, Operations Management

University of Auckland

Auckland, New Zealand

BE (1ST CLASS HONS)

May 2017

Advisors: Golbon Zakeri, Andy Philpott | GPA: 8.84/9.00 | Major GPA: 9.00/9.00 | Thesis: Pricing Wind Under Uncertainty

Research Interests

Methodological: Optimization (Discrete/Conic/Stochastic/Robust/Global), Machine Learning, Statistics.

Applications: Finance, Energy (Market Design/Renewable Integration/Pricing), Operations, Business Analytics.

Publications

* Ryan is a primary author on all articles, except where indicated otherwise with an asterisk. Other primary authors are bolded.

From Predictions to Prescriptions: A Data-Driven Response to COVID-19

with Dimitris Bertsimas et al., *Health Care Management Science*, 2021.

- First place, INFORMS Healthcare Applications Society William Pierskalla Best Paper Award (2020).

On Stochastic Auctions in Risk-Averse Electricity Markets With Uncertain Supply

with Golbon Zakeri, *Operations Research Letters*, 48(3):376-384, 2020.

On Polyhedral and Second-Order Cone Decompositions of Semidefinite Optimization Problems

with Dimitris Bertsimas, *Operations Research Letters*. 48(1):78-85, 2020.

Payment Mechanisms for Electricity Markets With Uncertain Supply

with Andy Philpott and Golbon Zakeri, *Operations Research Letters*. 46(1):116-121, 2018.

- First place, Operations Research Society of New Zealand Young Practitioner's Prize (2016).

Completed Works

Mixed-Projection Conic Optimization: A New Paradigm for Modeling Rank Constraints

with Dimitris Bertsimas and Jean Pauphilet, in revision at *Operations Research* (first decision: major revision).

- First place, INFORMS George Nicholson Student Paper Competition (2020).

Solving Large-Scale Sparse PCA to Certifiable (Near) Optimality

with Dimitris Bertsimas and Jean Pauphilet, in revision at *JMLR* (first decision: reject w. encouragement to resubmit).

A Unified Approach to Mixed-Integer Optimization Problems With Logical Constraints

with Dimitris Bertsimas and **Jean Pauphilet**, under review at *SIAM J. Optimization* (first decision: minor revision).

- First place, INFORMS Computing Society Student Paper Competition (2019).
- Finalist, MIP Workshop student poster competition (2020).

A Scalable Algorithm for Sparse Portfolio Selection

with Dimitris Bertsimas, in revision at *INFORMS Journal on Computing* (second decision: minor revision).

Books in Preparation

High-Dimensional Optimization Over Integers and Matrices

with Dimitris Bertsimas and **Jean Pauphilet**, Dynamic Ideas Press, targeted to appear in 2023.

Selected Honors and Awards

- 2020 **First place, George Nicholson Student Paper Competition, INFORMS**
First place, William Pierskalla Best Paper Award, INFORMS Healthcare Appl. Society
Finalist, Best Student Poster Competition, Mixed-Integer Programming Workshop
- 2019 **First place, ICS Student Paper Award, INFORMS Computing Society**
- 2017 **Senior Scholar Award (top of graduating class), University of Auckland**
- 2016 **First place, Young Practitioner's Prize, Operations Research Society of New Zealand**
- 2014-16 **Deans Honours List, Faculty of Engineering, University of Auckland**
First in Course Award x5, University of Auckland
- 2013 **Outstanding Scholar (top 50 high-school students in New Zealand), NZQA**

Research Experience

COVID Analytics: Core Team Member

Cambridge, MA

PRINCIPAL INVESTIGATOR: DIMITRIS BERTSIMAS

2020

- Lead effort to extract features from over 200 COVID-related clinical research papers early in the pandemic, which allowed the core team to more accurately tune parameters in machine learning tools developed to combat the COVID-19 pandemic.
- Core team awarded the 2020 William Pierskalla INFORMS Healthcare Applications Society best paper award for their efforts.
- Material from the effort available at: covidanalytics.io

Operations Research Center-MIT: Research Assistant

Cambridge, MA

SUPERVISOR: DIMITRIS BERTSIMAS

Sept. 2017 - Present

- Developed techniques for solving central problems in OR/ML literatures, with focus on certifiable optimality, scalability.
- Made methodological and algorithmic contributions to the fields of discrete and conic optimization, including developing new algorithms for solving cardinality and rank constrained problems to certifiable optimality.

University of Auckland- Dept of Engineering Science: Research Assistant

Auckland, New Zealand

SUPERVISOR: GOLBON ZAKERI

2016-2017

- Designed techniques for pricing electricity with uncertain supply, risk-aversion.
- Implemented pricing mechanism on a full-scale replica of the New Zealand Market.

Teaching Experience

15.071 The Analytics Edge

MIT

HEAD TEACHING ASSISTANT

Fall 2020

- Head TA for a class which introduces Sloan MBA students to data analytics. Class held virtually due to COVID-19.
- Duties: preparing/leading recitations, developing/grading assignments, holding office hours, supervising final projects.

15.S60 Computing in Operations Research and Statistics

MIT

SESSION INSTRUCTOR

Jan 2019, Jan 2020

- Instructor for 3-hour session which aims to provide PhD students with an overview of state-of-the-art software tools used in optimization and statistics.

15.095 Machine Learning Under a Modern Optimization Lens

MIT

TEACHING ASSISTANT

Fall 2019

- TA for a course which provides masters/PhD students with a modern treatment of machine learning using the lenses of convex, robust and mixed-integer optimization.
- Duties: preparing/leading recitations, developing/grading assignments/exams, holding office hours, supervising projects.

15.093 Optimization Methods

MIT

TEACHING ASSISTANT

Fall 2018

- TA for course which provides masters students with a unified overview of main algorithms and applications of optimization.
- Duties: preparing/leading recitations, developing/grading assignments, answering Piazza questions, holding office hours.

Mentoring Experience

15.089 Analytics Capstone

MIT

PROJECT MENTOR

Summer 2018, Summer 2019

- Advised two projects completed by teams of Master of Business Analytics (MBAN) students, who respectively applied machine learning techniques to predict fund flows at the financial advisor level for a large investment management company, and applied prescriptive analytics to optimize fund flows for a large investment management company.
- Summer 2018 mentees received award for best capstone presentation in graduating class.

Industry Experience

Derceto

Auckland, New Zealand

ASSISTANT OPTIMIZATION ENGINEER

2014-2016

- Developed and maintained several VBA/SQL tools used by Derceto engineers in daily operations, including automating a 9-step process for updating historical demand curves which previously took Derceto around 30 hours per client per year.
- Assisted with installing Aquadapt (Derceto's pump scheduling optimization software) for two of Derceto's newest clients.

Selected Invited Talks

High-Dimensional Optimization Over Integers and Matrices.

Presented at: The University of Auckland Engineering Science Seminar Series, October 2020.

Mixed-Projection Conic Optimization: A New Paradigm for Modeling Low-Rank Constraints.

Presented at: INFORMS Nicholson Finalists Session, November 2020; ORC Student Seminar Series, December 2020, MIT LIDS & Stats Tea, March 2021.

Solving Large-Scale Sparse PCA To Certifiable (Near) Optimality.

Presented at: INFORMS Optimization Society Conference, March 2020 (canceled due to COVID-19).

A Unified Approach to Mixed-Integer Optimization Problems With Logical Constraints.

Presented at: ICCOPT, August 2019; INFORMS, October 2019, MIT ORC Student Seminar Series, November 2019; MIT LIDS Student Conference, January 2020, MIP Workshop, May 2020.

Professional Activities and Service

2019-20 ORC Student Seminar Series, (Inaugural) Coordinator

2019 INFORMS Annual Meeting, Session Chair

MIT ORC Qualifying Exam, Tester and Proctor

Peer Review

Referee for: European Journal of Operational Research; IEEE Transactions on Power Systems; INFORMS Journal On Computing; INFORMS Journal on Optimization; Journal of Global Optimization; Omega.

Skills and Activities

Programming: Julia (preferred), R, VBA, SQL, MATLAB, Mathematica, C++, HTML, CSS.

Software: JuMP (preferred), Gurobi (preferred), MOSEK (preferred), CPLEX, most languages/solvers.

Languages: English (native), French (conversational), German (beginner).

Extracurriculars: Skiing, Running, Hiking, Waterpolo.

Citizenship: New Zealand, Ireland.