Ryan Cory-Wright

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Education

Massachusetts Institute of Technology, Cambridge, MA, USA
Candidate for PhD in Operations Research; expected completion, May 2022. GPA: 5.0/5.0
Advisor: Dimitris Bertsimas

University of Auckland, Auckland, New Zealand
BE (1st Class Honours) in Engineering Science, May 2017. GPA 8.84/9.00
Advisors: Golbon Zakeri, Andy Philpott.

Research Interests

Methodological: Optimization (discrete/conic/stochastic/robust), machine learning, statistics
Applications: Finance, energy (market design/renewable integration)

Publications

Mixed-Projection Conic Optimization: A Certifiably Optimal Framework for Rank-Constrained Problems
with Dimitris Bertsimas and Jean Pauphilet, to be submitted to Management Science.

Solving Large-Scale Sparse PCA to Certifiable (Near) Optimality
with Dimitris Bertsimas and Jean Pauphilet, submitted to Mathematical Programming.

A Scalable Algorithm for Sparse Portfolio Selection
with Dimitris Bertsimas, reject & resubmit at Operations Research (submitted June 2018, revised September 2019)

A Unified Approach to Mixed-Integer Optimization: Nonlinear Formulations and Scalable Algorithms
with Dimitris Bertsimas and Jean Pauphilet, Operations Research, under review (submitted June 2019).

- Awarded 1st place, INFORMS Computing Society Student Paper Competition (2019).
- Abridged version appeared in the Spring 2020 INFORMS Computing Society Newsletter.
- Finalist, MIP 2020 student poster competition (winner TBA).

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.

- Awarded 1st place, ORSNZ Young Practitioner's Prize (2016).

Talks

A Unified Approach to Mixed-Integer Optimization: Nonlinear Formulations and Scalable Algorithms
Presented at: ICCOPT, August 2019; INFORMS Annual Meeting, October 2019; MIT ORC Student Seminar Series (invited), November 2019; LIDS student conference, January 2020; MIP Workshop, May 2020 (via Zoom).

A Scalable Algorithm for Sparse Portfolio Selection
Presented at: INFORMS Annual Meeting, November 2018; ORC 65th anniversary, November 2018 (poster); LIDS student conference, January 2019; MIP Workshop, June 2019 (poster).

Payment Mechanisms and Risk-Aversion in Electricity Markets With Uncertain Supply
Presented at: ORSNZ, December 2016, EPOC mini workshop, July 2017; ISMP, July 2018.

Honors and Awards

2020 Finalist, MIP Workshop 2020 Best Student Poster Competition (winner TBA).
For: *A Unified Approach to Mixed-Integer Optimization: Nonlinear Formulations and Scalable Algorithms*

2019 First place, INFORMS Computing Society (ICS) Student Paper Award
For: *A Unified Approach to Mixed-Integer Optimization: Nonlinear Formulations and Scalable Algorithms*

2017 Senior Scholar Award, University of Auckland (top of graduating class).

2016 First place, Young Practitioner's Prize, Operations Research Society of New Zealand.
For: *Payment Mechanisms for Electricity Markets With Uncertain Supply*

2014-2016 Deans Honours List, Faculty of Engineering, University of Auckland (top 5% of class).

2014-2016 First in Course Award x5, University of Auckland.

2013 NZQA Outstanding Scholar Award (top 50 high school students in New Zealand).

Research Experience

2020-Present **Massachusetts Institute of Technology COVIDAnalytics Initiative, Team Member**
PI: Dimitris Bertsimas
Member of MIT's COVIDAnalytics initiative, which quickly develops and delivers tools for hospitals and policymakers in the US to combat COVID-19. Site: covidanalytics.io/

2017-Present **Massachusetts Institute of Technology, Cambridge, MA, USA**
Research Assistant. Advisor: Dimitris Bertsimas
Developing modern optimization techniques for solving central problems in the operations research, machine learning and statistics literatures, with focus on certifiable optimality and scalability. Also aiming to make methodological and algorithmic contributions to the fields of discrete and conic optimization.

2016-2017 **University of Auckland, Auckland, New Zealand**
Research Assistant. Advisor: Golbon Zakeri

Teaching Experience

IAP 2020 **15.S60 Computing in Operations Research and Statistics Instructor** (MSc/PhD level).
Taught a 3-hour session which aims to provide PhD students with an overview of state-of-the-art software tools used in optimization and statistics. Material available here.

Fall 2019 **15.095 Machine Learning Under a Modern Optimization Lens TA** (MBaN/MSc/PhD level).
Instructor in charge: Dimitris Bertsimas
Teaching assistant 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: Assisting students, leading recitations, writing and marking assignments and exams.

Summer 2019 **15.089 Analytics Capstone Project: Student Mentor.** Instructor in charge: Dimitris Bertsimas
Advised a project completed by two MBaN students, who applied prescriptive analytics to prescribe actions which optimize fund flows for a large investment management company.

IAP 2019 **15.S60 Computing in Operations Research and Statistics Instructor** (MSc/PhD level).
Taught a 3-hour session which aims to provide PhD students with an overview of state-of-the-art software tools used in optimization and statistics. Material available here.

Fall 2018 **15.093 Optimization Methods TA** (MBaN/MSc level). Instructor in charge: Bart Van Parys
Teaching assistant for a course which aims to provide masters students with a unified overview of the main algorithms and areas of application in optimization.
Duties: Assisting students, leading recitations, writing and marking assignments and exams.

Summer 2018 **15.089 Analytics Capstone Project: Student Mentor.** Instructor in charge: Dimitris Bertsimas
Advised a project completed by two MBaN students, who applied machine learning techniques to predict fund flows at the financial advisor level for a large investment management company.

- Mentees received an award for the best capstone presentation in their graduating class.

Work Experience

2014-2016 **Derceto Ltd**, Auckland, New Zealand
Assistant Optimization Engineer
Assisted with installing a pump-scheduling optimization tool for two municipal water providers.
Refurbished 5+ VBA spreadsheet tools used in day-to-day operations.

Professional Activities and Service

2019-2020 **Coordinator,** MIT ORC Student Seminar Series
2019 **Session Chair,** INFORMS 2019 Annual Meeting
2019 **Tester and Proctor,** MIT Operations Research Center Qualifying Exam
2018-present **Reviewer,** European Journal of Operational Research; IEEE Transactions on Power Systems; INFORMS Journal On Computing; INFORMS Journal on Optimization; Omega.

Skills and Activities

Programming Languages: Julia (preferred), R, VBA, SQL, MATLAB, C++, HTML, CSS.
Optimization Software: JuMP (preferred), CPLEX (preferred), MOSEK (preferred), most languages/solvers.
Languages: English (native), French (conversational), German (beginner).
Extracurriculars: Skiing, Running, Hiking.

Citizenship Citizen of New Zealand, Ireland.