

# Ryan Cory-Wright

✉ r.cory-wright@imperial.ac.uk | 🏠 ryancorywright.github.io | 📺 ryancorywright

## Academic Appointments

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**Imperial College Business School**, Imperial College London  
Assistant Professor of Analytics and Operations | Affiliated with Imperial-X

London, UK  
July 2023-

**IBM Research**  
Herman Goldstine Postdoctoral Fellow

Cambridge, MA  
2022-2023

## Education

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**Massachusetts Institute of Technology**

Cambridge, MA  
May 2022

PH.D. IN OPERATIONS RESEARCH

Advisor: Dimitris Bertsimas | Thesis: Integer and Matrix Optimization: A Nonlinear Approach

**University of Auckland**

Auckland, New Zealand  
May 2017

B.E. (1ST CLASS HONORS) IN ENGINEERING SCIENCE

## Research Interests

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Methodological: Optimization, Machine Learning, Statistics. Applications: Energy, Finance, Healthcare.

## Selected Honors and Awards

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- 2022 IBM Herman Goldstine Fellowship, IBM Department of Mathematical Sciences
- 2021 First place, Student Paper Competition, INFORMS Data Mining Section
- 2020 First place, George Nicholson Student Paper Competition, INFORMS  
First place, William Pierskalla Paper Award, INFORMS Health Applications Society
- 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 New Zealand

## Publications

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*A New Perspective on Low-Rank Optimization*

with Dimitris Bertsimas and Jean Pauphilet, Mathematical Programming, accepted, 2022.

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

with Dimitris Bertsimas, Jean Pauphilet, Operations Research, 70(6):3321–3344, 2022.

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

*A Scalable Algorithm for Sparse Portfolio Selection*

with Dimitris Bertsimas, INFORMS Journal on Computing, 34(3):1489-1511, 2022.

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

with Dimitris Bertsimas, Jean Pauphilet, Journal of Machine Learning Research, 23(13):1-35, 2022.

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

with Dimitris Bertsimas, Jean Pauphilet, SIAM Journal on Optimization, 31(3):2340-2367, 2021.

- First place, INFORMS Computing Society Student Paper Competition (2019).

- From Predictions to Prescriptions: A Data-Driven Response to COVID-19*  
with Dimitris Bertsimas et al., *Health Care Management Science*, 24:253-272, 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).

## Articles Under Review

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*Sparse PCA With Multiple Components*  
with Jean Pauphilet, submitted.

*Decarbonizing OCP*  
with Dimitris Bertsimas and Vassilis Digalakis Jr., submitted.

*Sparse Plus Low-Rank Matrix Decomposition: A Discrete Optimization Approach*  
with Dimitris Bertsimas and Nicholas Johnson, *R&R at JMLR*.

- First place, INFORMS Data Mining Section Student Paper Competition (2021)

## Articles in Preparation

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*A Stochastic Benders Decomposition Scheme for Large-Scale Data-Driven Network Design*  
with Dimitris Bertsimas, Jean Pauphilet, and Pericles Petrides, in preparation.

*Certifiably Optimal Low-Rank Matrix Completion*  
with Dimitris Bertsimas, Sean Lo, and Jean Pauphilet, in preparation.

*Optimal Cross-Validation for Sparse Ridge Regression*  
with Andrés Gómez, in preparation.

*AI Hilbert: From Data and Background Knowledge to Automated Scientific Discovery via Polynomial Optimization*  
with Sanjeeb Dash, Bachir El Khadir, and Lior Horesh, in preparation.

## Books in Preparation

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*Integer and Matrix Optimization: A Nonlinear Approach*  
with Dimitris Bertsimas and Jean Pauphilet, Dynamic Ideas Press.

## Teaching Experience (As TA)

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15.095 Machine Learning Under a Modern Optimization Lens	MIT
HEAD TEACHING ASSISTANT	Fall 2019, 2021

15.071 The Analytics Edge	MIT
HEAD TEACHING ASSISTANT	Fall 2020

15.093 Optimization Methods	MIT
TEACHING ASSISTANT	Fall 2018

## Invited Talks

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### INVITED RESEARCH SEMINARS

Decarbonizing OCP  
UMass Amherst MIE, March 2023.

A New Perspective on Low-Rank Optimization  
Lehigh ISE, November 2022.

Mixed-Projection Conic Optimization: A New Paradigm for Modeling Rank Constraints  
Rice CAAM, January 2022; CMU Tepper OR, January 2022; USC Viterbi ISE, January 2022; Georgia Tech ISyE, January 2022; Johns Hopkins Carey OM, January 2022; Princeton ORFE, January 2022; Imperial College London Analytics and Operations, October 2021; University of Auckland Engineering Science, October 2020.

## INVITED INDUSTRY PRESENTATIONS

Mixed-Projection Conic Optimization: A New Paradigm for Modeling Rank Constraints  
IBM TJ Watson Research Center, August 2022.

## INVITED PRESENTATIONS AT SINGLE-TRACK WORKSHOPS

Certiably Optimal Low-Rank Matrix Completion  
MIP Workshop, May 2023.

## INVITED CONFERENCE PRESENTATIONS AND GUEST LECTURES

Decarbonizing OCP  
SIAM Conference on Optimization, June 2023.

Sparse PCA With Multiple Components  
INFORMS, October 2022.

A New Perspective on Low-Rank Optimization  
ICCOPT, July 2022; IOS, March 2022; INFORMS, October 2021.

Mixed-Projection Conic Optimization: A New Paradigm for Modeling Low-Rank Constraints  
INFORMS Nicholson Finalists, November 2020.

Solving Large-Scale Sparse PCA To Certifiable (Near) Optimality  
Guest Lecture for MIT Class 15.095, November 2021; IOS, March 2020 (canceled, COVID-19).

A Unified Approach to Mixed-Integer Optimization Problems With Logical Constraints  
MIP Workshop, May 2020; INFORMS, October 2019; ICCOPT, August 2019.

A Scalable Algorithm for Sparse Portfolio Selection  
INFORMS, November 2018.

Payment Mechanisms and Risk-Aversion in Electricity Markets With Uncertain Supply  
ISMP, July 2018; ORSNZ Young Practitioner's Prize Finalists Session, December 2016.

## Industry Experience

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SUEZ Smart Solutions  
ASSISTANT OPTIMIZATION ENGINEER

Auckland, New Zealand  
2014-2016

## Selected External Activities and Service

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- 2023 SIAM Conference on Optimization, Mini-Symposium Organizer
- 2022 INFORMS Optimization Society Meeting, Session Chair
- 2019, 21 INFORMS Annual Meeting, Session Chair
- 2017- Member, INFORMS (Main Body, Computing Society, Optimization Society)  
Member, Mathematical Optimization Society

## Peer Review

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**Reviewer**

*Operations Research, Manufacturing and Service Operations Management, Mathematics of Operations Research, Foundations of Computational Mathematics, INFORMS Journal On Computing, INFORMS Journal on Optimization, SIAM Journal on Optimization, SIAM Journal on Mathematics of Data Science, European Journal of Operational Research, IEEE Transactions on Power Systems, Journal of Global Optimization, Journal of Optimization Theory and Applications, and Omega.*