Giorgio Costa

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EDUCATION

09/2015 – 12/2020 **Ph. D. in Industrial Engineering (Operations Research)**, *University of Toronto*
Advisor: Professor Roy H. Kwon — Thesis: Advances in risk parity portfolio optimization
GPA: 3.98 / 4.0 — Awards: $190,000 in scholarships, stipends and grants.

09/2007 – 05/2012 **B. Eng. Hons. in Mechanical Engineering**, McGill University

PROFESSIONAL EXPERIENCE

10/2021 – Present **Postdoctoral Research Fellow**, *Columbia University, IEOR Department*
New York, NY
Applications of machine learning and optimization theory to develop intelligent asset management models. Specifically, this pertains to data-driven portfolio construction models under uncertainty. The objective is to develop 'end-to-end' learning models that integrate both predictive modelling and optimization into a unified framework, resulting in more robust systematic investment strategies.

05/2021 – 10/2021 **Quantitative Investments Researcher**, *RBC Global Asset Management, Quantitative Investments*
Toronto, ON
Quantitative researcher in portfolio optimization, tactical asset allocation, risk attribution and factor modelling. Projects include: (i) the evaluation of current portfolio construction models by performing backtests and evaluating ex ante and ex post performance to validate the value proposition of RBC GAM's Low Volatility funds, (ii) the development of new tools to assess the statistical significance of performance measures, and (iii) the introduction of regime-switching for factor modelling. Projects were developed in both Matlab and Python.

01/2021 – 05/2021 **Postdoctoral Research Fellow**, *University of Toronto, MIE Department*
Toronto, ON
Applied optimization theory and machine learning techniques to develop robust systematic investment strategies for tactical asset allocation against adversarial or regime-dependent markets.

10/2017 – 09/2018 **Senior Risk Analyst**, *TD Wealth, Credit and Market Risk*
Toronto, ON
Developed and implemented a novel equity risk model to assess price shocks in stocks. The model development included feature selection and engineering, predictive model design, backtesting, and documentation. The model was successfully validated through the TD validation process.

10/2016 – 09/2017 **Research Associate**, *TD Securities, Capital Markets Risk Management*
Toronto, ON
Developed and implemented a mathematical model to simulate interest rate shocks under a negative interest rates environment for use in Monte Carlo simulations to compute the Bank's 10-day VaR.

07/2012 – 08/2015 **Mechanical Engineer-in-Training**, *Wood plc, Mining and Metals*
Oakville, ON
Performed computational fluid-flow simulations and stress analysis of piping systems.

ACADEMIC PUBLICATIONS AND TEACHING

Journal Publications and Preprints

- **Costa, G** & Kwon, RH (2021). Data-driven distributionally robust risk parity portfolio optimization. *Optim. Method. Softw.*
- **Costa, G** & Kwon, RH (2020). A robust framework for risk parity portfolios. *J. Asset Manag.*
- **Costa, G** & Kwon, RH (2020). Generalized risk parity portfolio optimization: an ADMM approach. *J. Glob. Optim.*
- **Costa, G** & Kwon, RH (2020). A regime-switching factor model for mean–variance optimization. *J. Risk.*
- **Costa, G.** & Kwon, RH (2019). Risk parity portfolio optimization under a Markov regime-switching framework. *Quant. Finance.*
- Wu, D, Kwon, RH, & **Costa, G** (2017). A constrained cluster-based approach for tracking the S&P 500 index. *Int. J. Prod. Econ.*

Course Instructor, *University of Toronto*

Win. 2018 – 2021	MIE377: Financial Optimization Models
Fall 2020	MIE236: Probability
Fall 2019	ECE302: Probability and Applications
Fall 2018	MIE375: Financial Engineering

Teaching Assistant, *University of Toronto*

Sum. 2017 – 2021	MMF1921: Operations Research
Fall 2017 – 2020	MMF2000: Risk Management
Fall 2019 – 2020	MIE479: Capstone Design Project
Fall 2016	MIE1621: Non-Linear Optimization

SKILLS

Programming	Python, Julia, R
Optimization	Gurobi, Mosek, Ipopt, JuMP, CVXPY
Software	Matlab, MS Office Suite
Cloud Computing	MS Azure, Docker