

Craig Fernandes

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Education

PhD Operations Research, University of Toronto Sep 2021 – May 2025

Advisors: Timothy C.Y. Chan and Ningyuan Chen

MASc Operations Research, University of Toronto Jan 2020 – Aug 2021

Advisor: Timothy C.Y. Chan

cGPA: A+/A+ in all course work

BASc Industrial Engineering, University of Toronto Sep 2014 – May 2018

Ranked 4th out of 105 students

Research Interests

Optimization, economics, public policy, engineering education, sports analytics

Submitted Papers

7. *Income pools for superstar markets*

Timothy Chan, Ningyuan Chen, Craig Fernandes

Under review at **24th ACM Conference on Economics and Computation (EC)**, 2023.

6. *Equity, diversity, and inclusion in sports analytics*

Craig Fernandes, Jason Vescovi, Richard Norman, Cheri Bradish, Nathan Taback, Timothy Chan

Major Revision at **Journal of Quantitative Analysis in Sports**, 2022.

Published Papers

5. *Case Article – Moneyball for Murderball: Using analytics to construct lineups in wheelchair rugby*

Timothy Chan, Craig Fernandes, Albert Loa, Nathan Sandholtz

INFORMS Transactions on Education, forthcoming, 2023.

- First Place, INFORMS Case Competition, 2022

4. *Advising student-driven analytics projects: A summary of experiences and lessons learned*

Aaron Babier, Craig Fernandes, Ian Zhu

INFORMS Transactions on Education, 23(2):121-135, 2023.

- Featured in ORMS Today Article

3. *A Markov approach to untangling intention versus execution in tennis*

Timothy Chan, Doug Fearing, Craig Fernandes, Stephanie Kovalchik

Journal of Quantitative Analysis in Sports, 18(2): 127-145, 2022.

- Finalist, MIT Sloan Sports Analytics Conference Poster Competition, 2022

2. *Points gained in football: Using Markov process-based value functions to assess team performance*

Timothy Chan, Craig Fernandes, Martin Puterman

Operations Research, 69(3): 877-894, 2021.

- Second place, CORS Student Paper Competition (Undergraduate Category), 2018

1. *Predicting plays in the National Football League*

Craig Fernandes, Ronen Yakubov, Yuze Li, Amrit Prasad, Timothy Chan

Journal of Sports Analytics, 6(1): 35-43, 2020.

Conferences

Income Pools for Superstar Markets

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| - INFORMS Annual Conference, Indianapolis (Oral) | 2022 |
| - CORS / INFORMS International, Vancouver (Oral) | 2022 |

A Markov approach to untangling intention versus execution in tennis

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| - MIT Sloan Sports Analytics Conference, Boston (Poster) | 2022 |
| - New England Symposium on Statistics in Sports, Boston (Oral) | 2021 |
| - U of T Engineering Research Conference, Virtual (Poster) | 2021 |
| - CORS Annual Conference, Virtual (Oral) | 2021 |
| - Sport Innovation Summit, Virtual (Poster) | 2020 |

Points gained in football: Using Markov process-based value functions to assess team performance

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| - U of T Engineering Research Conference, Virtual (Poster) | 2020 |
| - Sport Innovation Summit, Virtual (Oral) | 2019 |
| - CORS Annual Conference, Virtual (Oral) | 2018 |

Predicting plays in the National Football League

- | | |
|--|------|
| - U of T Engineering Research Conference, Virtual (Poster) | 2020 |
| - Sport Innovation Summit, Virtual (Oral) | 2019 |
| - New England Symposium on Statistics in Sports, Boston (Oral) | 2017 |

Teaching Experience

MIE263: Stochastic Operations Research

Teaching Assistant,

Winter 2023

MIE368: Analytics in Action

Teaching Assistant, Rating 4.79/5

Fall 2022

Teaching Assistant, Rating 4.96/5

Fall 2021

Teaching Assistant, Rating 4.84/5

Fall 2020

- MIE Departmental Group TA Teaching Award, 2021

Research Mentorship

Defining Soccer Playing Styles through a Data-Driven Approach 2021

M. Arif, **undergraduate thesis** (co-advised with Binghao Zhang)

Drafting for the Columbus Blue Jackets 2021

D. Nalbantoglu, K. Smith, Y. Pan, **engineering capstone project** (co-advised with Timothy Chan)

Points Gained in Curling: Modelling Curling as a Markov Reward Process 2020

J. Tin, **undergraduate thesis** (co-advised with Timothy Chan)

Optimizing Lineup Selection Dynamically in Wheelchair Rugby 2020

A. Loa, **undergraduate thesis** (co-advised with Timothy Chan)

Professional Experience

Amazon.com, Data Scientist I Summer 2021

- Formulated a gradient boosting classifier on AWS SageMaker to identify low performing promotions with an accuracy of 84%, resulting in an annual savings of \$25.6 million
- Presented results to senior leadership, garnering >\$100K of funding
- Established a cross-functional implementation and maintenance plan to productionalize the ML model, which is currently still deployed

PepsiCo, Process Improvement Engineering Intern Fall 2019 | Summer 2017

- Managed a team of three junior interns to drive process improvement initiatives across the plant
- Utilized lean manufacturing methodologies to optimize the production on three major machines, resulting in annual savings of 101 hours of downtime and \$73,000
- Created a comprehensive database and dashboard for the Toronto and Moncton facilities to pinpoint the optimal allocation of maintenance resources and presented the results to senior leadership

Applied Research Projects

Redeploy.ca, Co-Founder & Consultant 2020

- Developed a full stack software tool to optimize hospital staffing during the COVID-19 pandemic, speeding up the process by 400%
- Built the staffing algorithm using mathematical optimization and created a web application which received positive user feedback
- Collaborated with and advised 20+ hospitals worldwide, including University Health Network and was featured in several news articles

Service

Session Chair

CORS / INFORMS International (Sports Analytics)	2022
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Honors and Awards

Wallberg Research Fellowship (\$7,500)	2022
First Place, INFORMS Case Competition (\$500)	2022
U of T SGS Conference Travel Grant (\$800)	2022
U of T MIE Conference Travel Grant (\$650)	2022
Finalist, MIT Sloan Sports Analytics Conference Poster Competition	2022
Ontario Graduate Scholarship (\$15,000)	2021
First place, U of T Engineering Research Conference (\$300)	2021
U of T MIE Group TA Teaching Excellence Award (\$300)	2021
NSERC Canada Graduate Scholarship Master's (\$17,500)	2020
Second place, U of T Engineering Research Conference (\$300)	2020
Second place, CORS Undergraduate Student Paper Competition (\$200)	2018
U of T CSA Group Award (\$5,000)	2017
U of T President's Entrance Scholarship (\$5,000)	2014