

Craig Fernandes

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Education

PhD Operations Research, University of Toronto 2021 – Present
Advisors: Timothy C.Y. Chan and Ningyuan Chen

MASc Operations Research, University of Toronto 2020 - 2021
Advisor: Timothy C.Y. Chan
cGPA: A+/A+ in all course work

BASc Industrial Engineering, University of Toronto 2014 - 2018
Ranked 4th out of 105 students

Research Interests

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

Published Papers

1. *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, 2022.

- First Place, INFORMS Case Competition, 2022

2. *A Markov approach to untangling intention versus execution in tennis*
Timothy Chan, Doug Fearing, Craig Fernandes, Stephanie Kovalchik
Journal of Quantitative Analysis in Sports, 2022.

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

3. *Advising student-driven analytics projects: A summary of experiences and lessons learned*
Aaron Babier, Craig Fernandes, Ian Zhu
INFORMS Transactions on Education, 2022.

4. *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

5. *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.

Submitted/Working Papers

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

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

Under review at **Journal of Quantitative Analysis in Sports**, 2022.

7. *Income pool stability and contract design in volatile industries*

Timothy Chan, Ningyuan Chen, Craig Fernandes

In preparation for the **24th ACM Conference on Economics and Computation (EC)**, 2023.

Conferences

Income pool stability and contract design in volatile industries

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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

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|--|------|
| - 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, (Upcoming)

Winter 2023

MIE368: Analytics in Action

Teaching Assistant,

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

<i>Defining Soccer Playing Styles through a Data-Driven Approach</i>	2021
M. Arif, undergraduate thesis (co-advised with Binghao Zhang)	
<i>Drafting for the Columbus Blue Jackets</i>	2021
D. Nalbantoglu, K. Smith, Y. Pan, engineering capstone project (co-advised with Timothy Chan)	
<i>Points Gained in Curling: Modelling Curling as a Markov Reward Process</i>	2020
J. Tin, undergraduate thesis (co-advised with Timothy Chan)	
<i>Optimizing Lineup Selection Dynamically in Wheelchair Rugby</i>	2020
A. Loa, undergraduate thesis (co-advised with Timothy Chan)	

Service

Session Chair

CORS / INFORMS International (Sports Analytics)	2022
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Professional Experience

Amazon.com , Data Scientist I	Summer 2021
<ul style="list-style-type: none"> - Formulated a gradient boosting classifier on AWS SageMaker to identify low performing product promotions with an accuracy of 84%, resulting in an annual savings of \$25.6 million - Engaged with cross-functional stakeholders to garner buy in for the project and provided an implementation plan to push the model into production 	
PepsiCo , Process Improvement Engineering Intern	Fall 2019 Summer 2017
<ul style="list-style-type: none"> - Managed a team of three junior interns to drive process improvement initiatives across the plant to increase efficiency - 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 	

Other Projects

Redeploy.ca , Co-Founder & Consultant	2020
<ul style="list-style-type: none"> - 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 	

Honors and Awards

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