

# Craig Fernandes

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## Education

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**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 4<sup>th</sup> out of 105 students

## Research Interests

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

## Submitted Papers

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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

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

- Invited presentation at the MIT Sloan Sports Analytics Conference, 2023

## Published Papers

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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, 2022.

- 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**, Articles in Advance, 2022.

### 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

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### 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

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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

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### 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**

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

**Professional Experience**

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<b>Amazon.com</b> , Data Scientist I	Summer 2021
<ul style="list-style-type: none"> <li>- 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</li> <li>- Presented results to senior leadership, garnering &gt;\$100K of funding</li> <li>- Established a cross-functional implementation and maintenance plan to productionalize the ML model, which is currently still deployed</li> </ul>	
<b>PepsiCo</b> , Process Improvement Engineering Intern	Fall 2019   Summer 2017
<ul style="list-style-type: none"> <li>- Managed a team of three junior interns to drive process improvement initiatives across the plant</li> <li>- Utilized lean manufacturing methodologies to optimize the production on three major machines, resulting in annual savings of 101 hours of downtime and \$73,000</li> <li>- 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</li> </ul>	

**Applied Research Projects**

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<b>Redeploy.ca</b> , Co-Founder & Consultant	2020
<ul style="list-style-type: none"> <li>- Developed a full stack software tool to optimize hospital staffing during the COVID-19 pandemic, speeding up the process by 400%</li> <li>- Built the staffing algorithm using mathematical optimization and created a web application which received positive user feedback</li> <li>- Collaborated with and advised 20+ hospitals worldwide, including University Health Network and was featured in several news articles</li> </ul>	

## Service

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### Session Chair

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

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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