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. Forthcoming

- 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. Forthcoming

- 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. Forthcoming

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

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

A Markov approach to untangling intention versus execution in tennis

- 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

- 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, (Upcoming) Winter 2023

MIE368: Analytics in Action
Teaching Assistant, (Upcoming) 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)

Service

Session Chair
CORS / INFORMS International (Sports Analytics) 2022

Professional Experience

Amazon.com, Data Scientist I Summer 2021
- 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
- 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
- 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