

Mayleen Cortez-Rodriguez

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EDUCATION

CORNELL UNIVERSITY | CENTER FOR APPLIED MATH

PH.D. IN APPLIED MATHEMATICS

August 2020 - Present | Ithaca, NY

MASTERS OF SCIENCE | GPA: 3.7

August 2023 | Ithaca, NY

CALIFORNIA STATE UNIVERSITY, CHANNEL ISLANDS

BACHELORS OF SCIENCE IN MATHEMATICS | GPA: 3.91

MINOR IN COMPUTER SCIENCE

May 2020 | Camarillo, CA

PUBLISHED RESEARCH

Causal inference under interference & full network knowledge

- The Horvitz-Thompson (HT) estimator for the total treatment effect (TTE), while unbiased, suffers from high variance under Bernoulli design (BD)
- We provide unbiased estimators for the TTE with lower variance than HT under BD when interference is constrained to low-order interactions
- **Published** in Journal of Causal Inference (2023)

Causal inference under interference & no network knowledge

- Little to no work exists in the literature that can estimate the total treatment effect (TTE) without any knowledge of the underlying interference network
- Leveraging a staggered rollout design, we present unbiased estimators with low variance for the TTE that require no prior network knowledge
- **Published** in NeurIPS (2022)

Disease modeling & sensitivity analysis to inform disease control strategies

- Despite best efforts, no country has been able to eradicate tuberculosis (TB)
- We show that conducting time-dependent sensitivity analysis via active subspaces on a model of TB spread can help determine the most effective disease control strategies over the course of an epidemic
- **Published** in Spora: A Journal of Biomathematics (2019)

OTHER PROJECTS

ORSuite: benchmarking suite for sequential operations models | Spring 2021

- How do we optimally distribute a limited number of vaccines to a population?
- We formalized the *vaccine allotment* problem as a reinforcement learning (RL) problem and created Python scripts for simulating the impact of different vaccine allotment policies on disease spread through a population
- Part of larger project building a **Python package** (ORSuite)

Properties of peaks in parking functions | Summer 2019

- Enumerating parking functions of length n with no peaks is an open problem
- We proved lemmas and theorems related to properties of peaks in parking functions and created a **Jupyter notebook** with functions to analyze them

Using computer vision tools for safer solar panel maintenance | Fall 2018

- Solar panels on top of buildings without easy roof access are hard to inspect
- I worked on developing a collection of **Python scripts** to enable the use of drones to detect hot spots on solar panels, making inspection easier and safer

SKILLS

PROGRAMMING

Over 1000 lines:

Python • \LaTeX

Familiar:

MatLab • R • Julia • Java • SQL

VERSION CONTROL

GitHub • GitHub Desktop

IDES AND PLATFORMS

Visual Studio Code • Jupyter Notebook •

Google Colab • R Studio • Mac OS

Familiar:

Spyder • SQLite • IntelliJ IDEA •

Windows OS • Anaconda Navigator

LANGUAGES

Fluent in English • Proficient in Spanish

AWARDS

2023 Distinguished Service Award

2022 Netflix Travel Award to ACIC

2022 NeurIPS Travel Award

2020 NSF Graduate Research Fellowship

2020 Sloan Foundation Fellowship

2019 Outstanding Poster Presentation

2018 Scored on MAA Putnam Exam

CONFERENCES

Invited Talk INFORMS 2023; Phoenix, AZ

Poster ACIC 2023; Austin, TX

Talk CML4Impact 2022; New Orleans, LA

Poster NeurIPS 2022; New Orleans, LA

Poster MAA Regional 2019; Camarillo, CA

Talk NCUWM 2019; Lincoln, NE

Talk JMM 2019; Baltimore, MD

TUTORING

Statistics

Calculus

Intro to Programming

Logic and Reasoning

Linear Algebra

Intro to Proofs

COURSEWORK

Numerical Analysis

Abstract Algebra

Applied Stochastic Processes

Statistical Principles

Mathematical Statistics

Object-Oriented Programming

Data Structures