

Neil Mascarenhas

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EDUCATION

University of Michigan – LSA and Ross School of Business

BS in Mathematics of Finance and Risk Management, BS in Data Science, BBA

GPA: 3.65 / 4.00

Ann Arbor, MI

December 2024

RESEARCH

Mathematics Department

Research Assistant

University of Michigan

January 2025 – Present

- Assisting a math professor in researching algorithmic collusion using neural networks and reinforcement learning.

TEACHING EXPERIENCE

Operations Management and Project Management

WMBA 508 and WMBA 617 Grader

University of Michigan

September 2023 – December 2023

- Graded papers and provided feedback for over 60 students, answering questions and explaining relevant concepts.

Machine Learning for Investing

FIN 427 Tutor

University of Michigan

January 2024 – April 2024

- Mentored 6 students personally and provided general assistance to 70 students with the relevant course concepts of linear regression, decision trees, random forest, data cleaning, and implementation of these concepts in Python and R.

LEADERSHIP EXPERIENCE

Quantitative Consulting and Finance Group

President, Founder, Project Lead

University of Michigan

September 2021 - Present

- Implementing the SABR pricing model in C++ to construct a strategy based on mispricing of options in real-time.
- Implemented the Nelder-Mead algorithm for local constrained linear optimization to minimize mean-squared error.
- Developing a forecasting model in Python for options based on the SABR pricing model and Monte Carlo simulations.
- Developed trading strategy using network theory to draw industry lines with lead-lag relationships as a proxy with numpy, numba, and Wharton Research Data Services.

PROJECT EXPERIENCE

Markov Chain Monte Carlo Paper (Read [here](#))

Math 525 – Probability Theory Student

University of Michigan

January 2024 – April 2024

- Conducted a literature review of papers related to the Metropolis-Hastings Markov Chain Monte Carlo algorithms, synthesized these with course concepts about the convergence of Markov Chains, and provided relevant proofs.

Relationship Between Mental Health and Diabetes (Read [here](#))

Stats 451 – Bayesian Data Analysis Student

University of Michigan

January 2024 – April 2024

- Modeled and performed inference on the relationship between mental health categories and diabetes diagnosis using a beta-binomial hierarchical model and 5 million rows of CDC data related to mental health and chronic diseases.

WORK EXPERIENCE

LifeSync Inc.

Quantitative Analyst Intern

Coral Springs, FL

May 2023 – August 2023

- Automated 15 reports paramount to the finance departments' monthly breakdown of accounts using PowerBI.
- Learned best practices for finance/accounting database management to improve their database structure.

Yousif Capital Management*Quantitative Analyst Intern***Bloomfield Hills, MI***May 2022 – August 2022*

- Implemented a machine learning model trained on over 1.5 million transactions to detect anomalies in transactions and provide immediate feedback on potential typing/calculation errors using scikit-learn and Isolated Random Forest
- Planned and implemented a large-scale web scraping algorithm to automate searching over 5000 keywords, scrape the results, and rank new business opportunities with scrapy, ScraperAPI, and pandas.

Greenstone Farm Credit Services*Quantitative Developer Intern***East Lansing, MI***May 2021 – December 2021*

- Created a web scraping algorithm with Selenium to prepare and quality assure tax forms for 5000 clients, replacing the manual process while saving over 4,800 manhours and approximately \$30,000.
- Cleaned data using R Tidyverse, Regex, Python, and SQL and a plethora of creative solutions for address parsing, fuzzy matching, and zip code recognition for mapping to region/state/branches in Michigan.

SKILLS

Experienced in statistical analysis, linear regression, machine learning, probability, and financial mathematics. Highly skilled in R, Python, Latex, and SQL, proficient in C++, Javascript, HTML, and Swift.

CERTIFICATIONS

Baruch Pre-MFE Numerical Linear Algebra for Financial Engineering – Certificate of Completion with Distinction
Bloomberg Market Concepts
Akuna Capital Options 101

VOLUNTEER EXPERIENCE

Missionaries of Charity*Food Packer***Detroit, MI***May 2011 – Present*

- Packed bags of food items for underserved communities in the Detroit Area.

Forgotten Harvest*Farmer***Fenton, MI***May 2023 – August 2023*

- Harvested various vegetables from the Forgotten Harvest farm in Fenton and sorted through edible/non-edible beans.

Mission and Educational Immersion Trip*Volunteer***Peru***April 2019*

- Helped to build a shopping center in a village for locally crafted clothing for women who were adversely affected in income due to gender bias in the village.