

Andre M. Rodrigues

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Profile Summary

- Skilled **Math Ph.D.** candidate with **5** years experience in creating accurate mathematical models to describe and predict deformations in physical materials, capable of adapting quickly to new challenges and working on self-directed projects.
- Well-rounded data scientist proficient in **MATLAB**, **PYTHON**, and **TypeScript** with hands-on experience using **SQL** databases, pandas, and Flask web app to host machine learning models on AWS Lightsail for a trading bot operating on the **Ethereum Blockchain** while working in a **Web3** start-up.
- Team player who thrives in collaborative environments, demonstrated by active participation in college and graduate school hockey teams, always involved in club leadership and budget management.

Data & Analysis Skills

- Proficient in **MATLAB**, **PYTHON** and **Typescript**.
- Working Knowledge of **C**, **SAS** (Certified), **RStudio**, **MATHEMATICA**, and **SQL**.
- Strong theoretical foundation in **Machine Learning**, **Stochastic Calculus**, **Financial Math**, and **Statistics**.
- Portuguese- Native, English- Fluent, Spanish- Advanced.

Work Experience

Research and Development Engineering Intern

June 2022-September 2022

Uneven Labs, Santa Barbara, California

- Developed an **NFT trading bot** to improve market **liquidity**, leveraging TypeScript for blockchain interaction and SQL for handling big datasets, while improving teamwork and communication skills.
- Leveraged **API HTTP** requests and **OpenZeppelin Autotask** to extract data from **Redshift databases** and the **blockchain**, facilitating the training of several ML models to optimize the balance between the spread offered and inventory risk.
- Hosted the trading bot on **AWS Lightsail** and developed an API using **Flask web app** to enhance interaction with the ML model's algorithm output, enabling access from any platform.
- Gained expertise in crypto and economic concepts, including **liquidity pools**, **consensus mechanisms**, **tokenomics**, and **arbitrage** models through independent research and presented findings in company meetings, fostering knowledge sharing and collaboration.
- Identified multiple API bugs, detected vulnerabilities in mathematical models, and proposed alternative strategies for providing **liquidity** to the **NFT market**, demonstrating resourcefulness and commitment beyond the scope of the initial role in the start-up.

Graduate Researcher

September 2017-September 2023 (Expected)

University of California, Santa Barbara

- Developed innovative **mathematical models** to elucidate and predict deformation changes in physical materials under different loads, resulting in one published paper, and a second in preparation.
- Presented research findings at a conference and multiple seminars, showcasing effective communication and subject matter expertise.
- Optimized time by using **symbolic programming** to automate computational part of the research.
- Completed numerous coding and data science projects utilizing pandas and tidyverse, focusing on data visualization and implementing algorithms such as including logistic regression, **GLM**, **LDA**, **k-NN**, **PCA**, **Random Forest**, and **Dynamic Mode Decomposition** (Koopman Theory).

Teacher Assistant

September 2017-September 2023 (Expected)

University of California, Santa Barbara

- Review and refine thousands of lines of **Python** code during 9 quarters of teaching **Numerical Analysis**, showcasing expertise in programming and pedagogy.
- Design and lead a custom class for over 90 students across 2 summers, enhancing leadership and organizational skills while communicating complex mathematical concepts through accessible visual, written, and oral formats for a diverse audience.
- Mentored 4 undergraduate students on year-long research projects, focusing on the complexities of **blockchain mining** and **game theory**, helping them with their academic growth.

Research Fellowship

January 2017-August 2017

University of Aveiro, Portugal

- Employed the **Fast Discrete Curvelet Transform**, a generalization of Fourier Transform, for medical image processing, specifically to detect edges in X-ray images.
- Identified the limitations of **Curvelets** for the task and adapted the **MATLAB** toolbox to work with **Shearlets**, a more suitable approach for the given image analysis challenge.

Summer School on Applied Differential Equations

August 2015-August 2015

King Abdullah University, (KAUST), Saudi Arabia

- Collaborated on an in-depth course project focused on strategic **decision-making** by small agents in large populations, utilizing **mean-field game theory**.
- Co-authored a group publication in Involve, titled "Existence of positive solutions for an approximation of stationary mean field games."
- Gained proficiency in numeric and symbolic computation with **MATHEMATICA**, applying it to various mechanics models.

Education

University of California, Santa Barbara (UCSB), Santa Barbara, CA

Expected September 2023

Ph.D. Mathematics

- Dissertation Topic: **PDE's, Measure Theory and Material Science**

University of Coimbra (UC), Coimbra, Portugal

July 2016

M.S Mathematics (19/20), B.S. Mathematics with Minor in Physics (18/20)

- Placed in top 3% of Best Students of University 4 out of 5 years.
- Dissertation: "Regularity properties for the porous medium equation".
- Awarded research Fellowship "Young Talents in Mathematics" from Calouste Gulbenkian Foundation.

Organizational Management Experience**Sports Council CFO & Hockey Board Member**

January 2012-December 2016

Coimbra, Portugal

- Represented **4,000** athletes as CFO for Coimbra Students' Union Sports Council, managing a **€1,000,000** annual budget across 26 sports teams during an economic recession.
- Served as Board Member of Roller-Skating Organization, A.A.C., Portugal, overseeing **10** hockey teams with **180** players and a **€70,000** annual budget, constantly negotiating with players and parents.
- Demonstrated strong organizational skills by planning and executing **10+** sports events for over **400** athletes, managing scheduling and accommodation logistics.
- Competed at a high level on the main hockey team since age **16** and led the college team to two national titles, balancing a **25-hour/week** commitment with academic pursuits.