Connor Martinez Lockhart

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SUMMARY

I am a 5th-year Mathematics PhD candidate (Expected 2027 Spring) from University of Maryland, with 4+ years of experience in Python and R. Specializing in logic and combinatorics with a focus on random graphs, combinatorial optimization and the probability and statistics of large network graph models. I am passionate about applying rigorous statistical analysis to data science, financial modeling and alpha generation. I have extensive experience communicating and simplifying high level interdisciplinary mathematical research to every level.

EDUCATION

University of Maryland, *PhD in Mathematics,* Expected Spring **2027**
MA in Mathematics Spring **2025**
University of Chicago, *BA in Mathematics with Honors,* Spring **2021**

QUANTIATIVE PROJECTS

Review Aggregate Critical Film Success Predictor - [LINK] - *The Erdős Institute*
● Using the Letterboxd review dataset, implemented accuracy analysis metrics inspired by pollster ratings and outlier detection to identify reviewers with predictive power for critical success of films. Formed aggregates of reviewers via community detection algorithms and machine learning models alongside time-series analysis to understand reviewer sentiment trends. Generated predictive signals for award outcomes, analogous to alpha generation with planned applications including finding misspricing on financial betting markets.

Levenshtein-distance Stock Typo Analysis - [LINK]
● Designed a data analysis pipeline to study prevalence of buying pressure due to typos implemented by retail traders. Automated pulling latest trade data and analysis of likely pairs. Used smart filtering of names and keyboard distance to identify alpha based on genuine typos as opposed to spurious correlation. Additionally implemented an analysis to detect typo trading on high volume and high likelihood days like IPOs.

Computational Search for 3-existential graphs - [LINK]
● Implemented a graph generation and exhaustive search algorithm in C to catalog low vertex examples for graphs with certain combinatorial properties. Implemented the algorithm in Google Cloud Platform and made a searchable database in BigQuery.

Academic projects

Pseudofiniteness of the Farey Graph - *University of Maryland*
● Large graph Monte Carlo simulations were used to gather empirical heuristics to inform formal proofs on the first order properties of the Farey graph. Used results at the interplay of finite and infinite graph theory to answer interdisciplinary questions in the geometric group theory of surfaces. Results to be published Spring 2026 and used in an ongoing thesis research project.

Universal Transversal sequence for Finite Automata - *University of Maryland*
● Solved an open problem in the theory of finite automata concerning solvability of infinite mazes by blind robots.
● Gave a complete classification of when solvability is possible. Techniques used included computational complexity theory and random walks on graphs. Publication expected Spring 2026

Logic Research Group Wiki - [LINK] **-** *University of Maryland*
● Organized and led a team of graduate students in logic to build a database of hard to find proofs and definitions in model theory.

AI benchmarking with Lean4 dataset - *University of Maryland*
● Worked with a team of graduate students to source original research problems in mathematics to benchmark cutting edge LLMs. Furthermore, formalized these problems in Lean4 to benchmark the ability of LLMs to write Lean4 code. Publication expected Summer 2026..

WORK EXPERIENCE

University of Maryland, *Research Assistant & Teaching Assistant* (College Park, MD) **2021- Present**
● Lectured in problem-solving sessions and led discussions for over 540 students across 9 semesters. Subjects taught include Calculus 1,2,3, Linear Algebra, Signal Processing, Mathematical Logic and Probability with experience teaching R and MATLAB.
● Nominated for the Aziz Osborne Gold Medal in Teaching Excellence, 96% of students recommended or strongly recommended in teaching evaluations.

Mercor / FrontierMath Benchmarking - *IMO and AI Benchmarking Expert* **December 2025- Present**
● Worked on a team to formulate and formalize novel International Math Olympiad (IMO) style problems for the purpose of

benchmarking LLM problem solving ability.

Brin Maryland Mathematics Summer Camp, *Counselor* (College Park, MD) Summer **2025**
● Taught an intensive program of mathematics topics to competitively admitted highschoolers including mathematical olympiad style problems at the USAMO level.

SKILLS & CERTIFICATIONS

● Languages & Platforms: Python (4 years), Haskell (2 years), OCaml (1 year), HTML (1 year), R (3 years), MATLAB (4 years)
● Quantitative: Machine Learning, Pytorch, Tensor Flow, Data Structures and Algorithms, Probability and Statistics, Game Theory, Graph Theory, Combinatorics, Linear Algebra.
● Certifications: Python (*The Erdős Institute*), Data Science (*The Erdős Institute*)

LEADERSHIP EXPERIENCE

University of Maryland, Mathematics Directed Reading Program, *President* (College Park, MD) **2023 - Present**
● Administered undergraduate-graduate student pairings to read research texts in mathematics. I have supervised 4 projects.
● While president, streamlined the application and review process leading to 50% more pairings and less administrative load.

VOLUNTEER EXPERIENCE

DC Department of Corrections, Petey Greene Program, *Instructor & Tutor* (Washington DC) **2023 - Present**
● Volunteered for the Petey Greene program to teach, tutor and design mathematical curriculum for inmates
● Worked with a variety of student backgrounds, designing curriculum for GED preparation, general mathematics education and college readiness programs.

DC Math Circles, *Instructor* (Washington DC) **2022 - 2023**
● Volunteered for an after school mathematics programs for 6th graders teaching combinatorics, probability, and other mathematical subjects not typically found in the middle school curriculum.

AWARDS

University of Maryland, Seymour Goldberg Gold Medal - Spotlight on Graduate Student Research **2023**
University of Maryland, Dean's Fellowship **2021,2022**