

Brendan Connelly

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EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES

2023 – 2027

B.S. in Mathematics; Minor: Data Science Engineering

- GPA: 3.95
- **Awards:** Dean's Honor List (6x), UCLA Alumni Scholar, AIME Qualifier (2023)
- **Selected Completed/In-progress Courses:** Graduate Complex Analysis, Graduate Data Science and Machine Learning for Finance, Graduate Agentic AI for Autonomous Research in Quantitative Finance, Combinatorics, Real Analysis I & II, Topology, Algebra I & II, Probability Theory

RESEARCH/INTERNSHIP EXPERIENCE

UCLA Computational and Applied Mathematics REU, Quantum Sensing Group

Jun 2025 – Aug 2025

Student Researcher, advised by Prof. Andrea Bertozzi

- Conducted NSF-funded research on machine learning methods for infrared frequency-comb spectroscopy, with emphasis on rank estimation, NMF regularization, signal unmixing, and high-dimensional data analysis.
- Delivered a first-author oral presentation at SPIE Photonics West (2026); proceedings paper published in SPIE.

PROJECTS AND RESEARCH

NMF Regularization Techniques for Unmixing Frequency Comb Data

2026

Published — Proceedings of SPIE: Quantum Sensing, Imaging, and Precision Metrology IV

- Connelly, B.B., Derderian, A., Faiaz, N., Tang, H., Tyler, M.J., Diab, J., Narang, P., and Bertozzi, A.L.

Cross-Asset Order Flow Imbalance Networks for Return Prediction

Fall 2025

Graduate course project, Math 279 (Data Science & ML for Finance), supervised by Prof. Mihai Cucuringu

- Modeled cross-asset return prediction from order flow imbalance data using structured OFI-based cross-impact matrices under ridge and lasso regularization; methods included PCA compression, spectral denoising, and statistical learning for predictive signal generation. [\[write-up\]](#)

Unimodality of Fibonomial Coefficients

Sept 2025 – Present

Directed Reading Program & Student Researcher, mentored by two UCLA Ph.D. students

- Finishing a draft paper with four co-authors proving special cases of a conjecture on the unimodality of q -Fibonomial coefficients, with combinatorial and algebraic proofs for the $n = 2$ and $n = 3$ cases.

LEADERSHIP AND CAMPUS INVOLVEMENT

Undergraduate Math Student Association (UMSA), Co-President

Apr 2024 – Present

- Lead coordination of academic, social, and corporate events for UCLA's official math student organization; served as primary organizer for quantitative finance industry talks with Jane Street Capital and Tower Research Capital.
- Collaborate with faculty and students to provide academic support, career panels, and department outreach.

Pedagogy Head Learning Assistant & Course Grader, Proof-Based Linear Algebra

Sept 2024 – Jun 2025

- Supported students in proof-based linear algebra through weekly discussions and proof-writing workshops.
- Worked as a paid course reader under Prof. Kent Vashaw, grading weekly homework assignments.

UCLA Residential Life, Resident Government Council & Resident Assistant (RA)

Oct 2024 – Present

- Serve as a live-in leader and first point of contact for a community of ~ 110 residents, fostering an inclusive and supportive environment while promoting academic success and personal growth.

Writer/Editor, Bruin Political Review

Sept 2025 – Present

- Write and edit quarterly analytical articles on topics including [British electoral politics](#) and [transatlantic relations](#).

WORK EXPERIENCE

UCLA Olga Radko Math Circle, Lead Instructor

Apr 2025 – Present

- Teach advanced problem-solving to high school students in a competitive, free math enrichment program.
- Design and lead weekly sessions focused on creative reasoning, proof writing, and mathematical exploration.

SKILLS

Programming & Tools: C++, Python (NumPy, pandas, scikit-learn), MATLAB, L^AT_EX, Git, Excel

Methods: Machine learning, statistical modeling, mathematical modeling, regularization, PCA, signal processing, technical writing