

Shamuel Auyeung

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SUMMARY

Mathematics PhD with expertise in probability, statistics, and data science, specializing in Python, machine learning, and quantitative modeling. Skilled at applying advanced mathematical techniques to identify patterns in financial markets and inform data-driven decision-making. Adept at solving complex problems, extracting actionable insights, and collaborating in dynamic, research-focused environments.

SKILLS & CERTIFICATIONS

- **Quantitative:** statistical analysis and modeling, probability (stochastic processes), calculus, linear algebra
- **Languages/Platforms:** Python, GitHub, MS Excel, VSCode, Mathematica, Dolt; Linux, SQL, C++, MATLAB
- **Python Libraries:** Pandas, NumPy, Scikit-learn, Matplotlib, seaborn, statsmodels, ARCH, Prophet
- **Machine Learning/AI:** model validation, linear regression, XGBoost, Random Forest, LLM's, NLP (Flair, Fundus), ARIMA
- **Certifications:** The Erdős Institute [Data Science Boot Camp](#), [Quant Finance Boot Camp](#)
- **Finance:** Series 7 (General Securities Representative Exam) and Series 63 (Uniform Securities Agent State Law Exam)

WORK EXPERIENCE

Goldman Sachs, Private Wealth Management: New York, NY

Aug 2025 - Present

Quantitative Strategist - Associate

- Designed and productionized fraud detection models using feature engineering, hyperparameter optimization, and rigorous evaluation across onboarding and money movement flows.

Trinity College, Department of Mathematics: Hartford, CT

Jul 2023 - Jun 2025

Harold L. Dorwart Visiting Assistant Professor, Center for Teaching and Learning Fellow (2025-2026)

- Taught single/multivariable/vector calculus, statistics, and differential equations, translating abstract mathematical concepts into intuitive explanations. Developed problem-solving skills, emphasizing logical reasoning and quantitative analysis.

SELECTED PROJECTS

[Predicting Agricultural Future Contracts with Exogenous Factors](#) (The Erdős Institute)

Spring 2025

- Developing predictive models for agricultural futures by integrating USDA reports and weather/geographic raster data, enhancing baseline regression on historical data, and achieving a positive R² in forecasting log returns.

[The Effects of Daylight Savings Times \(DST\) on Market Outcomes](#) (The Erdős Institute)

Fall 2024

- Developed machine learning models (logistic regression, k-NN, random forest with AdaBoost) to analyze DST effects on US and Japan stock markets, uncovering statistically significant ($\alpha=0.05$) fall return shifts and spring volatility changes.

SELECTED PUBLICATIONS

Adjacent Singularities, TQFTs, and Zariski's Multiplicity Conjecture, [arXiv](#)

2024

- Resolved a 52-year-old algebro-geometric conjecture by leveraging Floer cohomology.

On the algebra generated by $\bar{\mu}, \bar{\partial}, \partial, \mu$, with J. Guu, J. Hu, [Complex Manifolds](#)

2023

- Established new results for differential bi-graded algebras through computational experimentation, leveraging software to uncover algebraic structures and relationships.

The Krein Matrix and an Interlacing Theorem, with E. Yu, [SIURO](#)

2014

- Performed spectral analysis and numerical computations in MATLAB to investigate a generalized eigenvalue problem, deriving insights into its behavior and applications to Sturm-Liouville problems.

LEADERSHIP EXPERIENCE

The Erdős Institute Data Science Boot Camp Teaching Assistant

Jan - Jul 2025

- Mentored PhDs in data science and machine learning, providing hands-on guidance to accelerate their understanding and application of key concepts.

Graduate Student Seminar co-founder and organizer, Stony Brook University

2019-2023

- Co-founded and organized the Graduate Student RTG and Symplectic Geometry Seminars, creating a platform for students to explore advanced topics in geometry, topology, and mathematical physics beyond PhD coursework.

EDUCATION

Ph. D. Stony Brook University, Mathematics (geometry and topology)

Aug 2023

B.S. Calvin University, Mathematics, summa cum laude

May 2017

- NSF Scientific Computing Scholar: for excellence in mathematical modeling and computation.
- Barry Goldwater Scholar: for excellence in mathematical research.
- Top 17% in 2014 [William Lowell Putnam Mathematical Competition](#).