

Gregory Barco

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EXPERIENCE AND RESEARCH

CUNY Brooklyn College, Department of Mathematics

Brooklyn, NY

Research Assistant, Applied Mathematics and Computational Finance | Python, Fortran

Aug. 2025 – Present

- Co-authored regime-switching model applications to derivatives pricing with PhD faculty via two-state Hidden Markov framework fitted by MLE; manuscript in final preparation, targeting Fall 2026 submission.
- Constructed live market data pipeline integrating institutional rate curves, term structures, and dividend yield inputs across equity, commodity, and crypto options chains for per-asset sensitivity analysis.
- Priced 38 derivative contracts (Vanilla, Asian, Barrier – Calls and Puts); benchmarked Markov Monte Carlo against Black-Scholes and live market mid prices across 1–2,000 DTE, with model prices convergent to bid-ask spread.
- Calibrated risk-neutral parameters against live market option chains via Differential Evolution and quasi-Newton polishing; Deep Galerkin Method (DGM) neural network in development for mesh-free PDE cross-validation.
- Assessed model compatibility across five asset classes, 12 assets; classified assets by calibration behavior and documented model boundary conditions for academic publication.

U.S. House of Representatives, Office of Rep. Adriano Espaillat

Washington, DC

Congressional Intern | Budget & Appropriations | 118th Congress

Jan. 2024 – Apr. 2024

- Evaluated Basel III Endgame impact on banks and consumer mortgage liquidity; delivered findings as regulatory memoranda informing the Congressman's vote on proposed banking revision requirements.
- Led cohort in ranking top 75 FY'25 appropriations priorities from **\$1.27T** in FY'23–'24 enacted allocations across 20 agencies; scored by regulatory impact and budget variance; **\$14.7M** in secured cross-agency funds.
- Anchored **\$14.7M** total (\$10.9M HUD) from **\$126.6M** in NY-13 request; 14/15 funded; key awards: CUNY Dominican Studies \$3M, 125th St. Corridor \$2.5M, BCC Auto Tech \$1M (THUD Pg. 148–149 and Pg. 37).
- Jointly identified Kingsbridge Armory as FY'25 HUD priority submission; \$500K award (THUD Pg. 149); contributing to \$216M public stack; \$2.9B projected impact, 3,600 jobs, 500 affordable units (NYC Council, Oct. 2025).
- Authored 50+ regulatory memoranda for legislative and press teams; held 10+ cross-sector Appropriations stakeholder briefings; presented analytical findings to inform appropriations, vote positions, and district strategy.
- Produced 8-page district priority memo and geographical heat map of 30 NY-13 subsector priority zones; engineered 4-year dataset in R from 255+ ZIP codes; underpinned the **\$126.6M** CPF prioritization framework and floor votes.

CUNY Brooklyn College, Central Depository

Brooklyn, NY

Financial Assistant (R, JavaScript, HTML/CSS)

Mar. 2023 – Present

- Built full-stack procurement platform serving 14K students; automated vendor order submissions, document intake, and confirmation emails through a Google Sheets data pipeline supporting 100+ student clubs.
- Surfaced 38% procurement spend reduction via R time-series forecast of seasonal vendor expenditures; modeled equivalent volume under alternative supplier, directly informing a PepsiCo contract switch.

EDUCATION

CUNY Brooklyn College

Brooklyn, NY

Bachelor of Science in Applied Mathematics | Minor: Actuarial & Financial Mathematics

May 2026

- Honors:** Tow Foundation Research Grant, Geraldine Williams Scholarship, Carol Zicklin Fellowship

TECHNICAL SKILLS

Platforms	Bloomberg Terminal, Excel, SQL, Tableau, Charles Schwab API, PowerBI, Git
Programming	Python (NumPy, SciPy, Matplotlib, Statsmodels), Fortran, Java, R, C++, Linux CMD
Quantitative Methods	Probability Theory, Stochastic Calculus, MLE, Numerical Optimization, Monte Carlo, Markov Chain, Regime-Switching, Time Series, Regression, Statistical Inference, Machine Learning
High-Performance	OpenMP, CUDA/GPU Computing, Intel MKL, Intel oneAPI, Low-level Memory Management
Language	Russian (Working Proficiency)
Certifications	Bloomberg Market Concepts (BMC) · Machine Learning – Stanford / DeepLearning.AI, 2025