PHILIP O. CARDOZO

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EDUCATION

Emory University — **Atlanta, GA**
Bachelor of Science in Applied Mathematics & Statistics; Double Major: Computer Science — May 2028
Cumulative GPA: 3.6/4.0
Relevant Coursework: PDEs; Math Statistics I & II; Math for Data Science; Machine Learning; Analysis of Algos; Databases & Mining

Federal University of Rio de Janeiro — **Rio de Janeiro, Brazil**
Bachelor of Science in Computer Science — Feb. 2024 – Aug. 2024
Cumulative GPA: 87/100 (Top 5% of cohort)
Relevant Coursework: Computer Programming; Systems Fundamentals; Software Processes; Discrete Mathematics, Calculus I

WORK EXPERIENCE & RESEARCH

Atmosphere Capital — **New York, NY**
Incoming 2026 Summer Derivatives Analyst — Jun. 2026 – Aug. 2026

Stochastic Processes Research with Ph.D. Mitchell Scott | Academic Paper — **Atlanta, GA**
Researcher & Mentee — Jan. 2026 – Present
- Attend weekly meetings about stochastic processes, volatility arbitrage, and coding implementations of academic research
- Co-authored academic paper on volatility arbitrage, combining rough fractional Volterra processes ($H \approx 0.07$) with MCMC regime detection to price short-dated equity index straddles with self-exciting Hawkes jump-diffusion process, achieving Sharpe ratio of 1.38
- Reached 0.87 naive volatility benchmark with 4,096-path simulations in $O(N^{-1/2})$ convergence, improving Calmar ratio from 0.23 to 0.57

Veratori.com | Start-Up — **Atlanta, GA**
Co-founder & Chief Technology Officer — Jan. 2025 – Present
- Raised $22K initial investment for research and cybersecurity hardware to reduce fast-casual restaurants waste and costs
- Lead 4-person ML team building reinforcement learning for restocking and client demand forecasting with VLM tech & LiDAR
- Closed 20 franchises deal with 4 different clients, installing AI computer vision for inference strategy, earning $46k in yearly income

Linker Vision — **Remote**
AI Software Engineer Intern — Jun. 2025 – Aug. 2025
- Optimized enterprise real-time object detection model for NVIDIA Jetson edge devices to reduce latency using TensorRT
- Collaborated with the Engineering & Research team to refactor an inference engine, decreasing GPU heat for constant results
- Integrated 5,000+ images from an AI SaaS cloud simulations for the smart city project, increasing model's accuracy and context

LEADERSHIP & COMMUNITY INVOLVEMENT

Algory Capital — **Atlanta, GA**
Quantitative Analyst — Aug. 2024 – Dec. 2025
- Analyzed risk for $100K portfolio, building long/short LSTMs equity and derivative strategies using GARCH & volatility models
- Reported simulation results of mean-variance optimization, efficient frontier analysis, and stress-tested fundamental strategies
- Collaborated with 5 devs to conduct code reviews and present strategy pitches, while receiving 1-on-1 mentorship from senior analyst

Blockchain at Emory — **Atlanta, GA**
Chief Technology Officer, Head of Mining & Website Developer — Feb. 2025 – Present
- Led a 5-devs team to build 24/7 ASIC mining rigs monitoring and MultiSig app deployed on AWS, achieving 900 TH/s on a $2K hardware budget with Solana Foundation subsidies, generating $1,500 in yearly gross revenue for hackathon team flights
- Ran weekly educational GBM on automated trading simulations, derivatives model, and mining protocols verification across 2 sites
- Represented the club at ETHDenver, Penn Blockchain, and HackATL, building projects in DeFi, smart contract infrastructures

Pocket Aces Trading — **Atlanta, GA**
Member — Sep. 2025 – Present
- Receive quantitative finance and probability theory skills through weekly workshops on options pricing, and algorithmic strategy
- Deployed C++ pairs trading algorithm on Azure Cloud, leveraging Brownian Motion for signal generation and IBKR API data
- Compete in poker tournaments and card-counting competitions, applying mental Bayesian reasoning and real-time risk assessment

Slow Food Emory Produce Initiative — **Atlanta, GA**
- Promote clean food systems, redirecting surplus from DCT & Cox dining halls to combat food insecurity in Decatur

PROGRAMMING & TECHNICAL PROJECTS

Point72 Academy Case Competition 2025 MNDY Stock Analysis Research
- Built multi-model quant framework across 8 independent models with 20M Monte Carlo simulations and time-series forecasting
- Cross-validated output with fundamental DCF and comparable company analysis, co-developing a Short pitch ($71.33 target)
- Stock subsequently declined from $185 to ~$73, validating thesis within 1% of target and advancing to the final phase at Point72 HQ

High Frequency Trading with Hawkes Process | C++, Shell, SQLite, Eigen, Docker, Prometheus Source Code
- Executes futures and options with 9ms with 24/7 market data updates, 0-300% leverage, and Hawkes Process using IBKR data
- Calculates risk featuring pre-trade margin preview, VaR limits with auto kill-switches and persistent SQLite audit trails
- Uses Prometheus metrics and Dockerized Azure deployment to provide real-time dashboards, PnL, and latency visualization

Fourier-Based Methods for Risk-Neutral Option Pricing | Python, NumPy, yfinance Source Code
- Built risk analysis engine to price options across 6 stochastic models via Carr-Madan FFT, achieving sub-$0.01 pricing error
- Calibrated implied volatility surfaces using differential evolution optimization on Heston models, reaching <5 bps RMSE
- Computed VaR, CVaR, and Greeks via Fourier inversion, delivering $O(N^{-2})$ convergence, instead of Monte Carlo's $O(N^{-1/2})$

Systematic Portfolio Optimization MPT | NumPy, Pandas, SciPy, Matplotlib, yfinance Source Code
- Optimized portfolio library with 4 strategies (Max Sharpe, Min Vol, Risk Parity, CVaR), achieving a 1.34 Sharpe ratio
- Estimated Black-Litterman return & Ledoit-Wolf shrinkage covariance for 10-asset universe, delivering 12.28% annualized revenue
- Backtested walk-forward with mark-to-market weight drift, turnover constraint, and transaction cost modeling across 5y of data

FDIC & ABS Intelligence System (NEXUS) | LeastSquares, Bayes, Cypher Source Code
- Powered Neo4j risk engine to visualize complex financial networks and uncover hidden debt patterns that traditional tools miss
- Automated data ingestion with custom Python pipelines, cutting down manual review cycles by streamlining disparate sources
- Applied graph centrality algorithms to score credit exposure, significantly sharpening the detection of high-risk network links

Regime-Aware Multi-Agent Portfolio Allocator (RAMPA) | PyTorch, SVM, Decision-Trees Source Code
- Combined HMM regimes and LightGBM alpha across 3,500+ trading days with PPO agents in 5-phase ML portfolio allocator
- Engineered DNN to calibrate rough Bergomi volatility parameters from 42-point IV surfaces at ms latency w/o numerical iteration
- Eliminated lookahead bias via purged cross-validation with a 5-day embargo window; validated against MVO, equal-weight

Deep Learning Forecasting for Urban Air Quality | PyTorch, JAX, Flax, Optax, Snowflake Source Code
- Used Logistic Regression, Gaussian Processes, and Neural Networks to predict PM2.5 levels across 420k urban air quality records
- Achieved 74% empirical coverage for 95% prediction intervals with calibrated multi-horizon uncertainty with Bayes Estimation
- Created 50+ meteorological features, temporal validation, automated backtesting, and reproducible Snowflake ML experiments

2026 World Cup Winner Prediction via Neural Networks | PyTorch, Scikit-learn, XGBoost Source Code
- Executed 100k Monte Carlo, ML & neural network simulations, predicting World Cup match outcomes with >65% accuracy
- Parameterized 45+ models achieving under 0.8 log loss and a <0.15 Brier score, refining probability predictions of 153 indicators
- Extracted and cleaned public FIFA & Elo public Kaggle data, calibrating non-stationary probability models on 12 past tournaments

Deep Learning for Schwarz-Christoffel Maps | NumPy, Pandas, Scikit-learn, PyTorch, MATLAB Research Paper
- Iterated numerical neural networks to compute Schwarz-Christoffel conformal maps, turning unit disks onto polygons
- Linearized real and complex shapes with MLP ReLU, Xavier initialization, backpropagation for gradient flow and noise reduction
- Reached 0.0038 MSE with ELU activation on fixed quadrilaterals and 0.0194 on variable-vertex Fluid Mechanics datasets

Exploring Style Factors in Cryptocurrencies | Bitbo, Pandas, NumPy, Statsmodels, VBA Research Paper
- Decomposed crypto risk returns into systematic risk factors with long-short Factor Ratio and Momentum Model portfolios
- Proved liquidity and volatility are statistically significant return drivers with 160.38% annualized returns and Sharpe ratio of 0.93

Numerai Tournament Q3 2024 | Numerai Market Residuals Agent Algorithm
- Uploaded ML algo. blending six LightGBM regressors on Numerai v5.2 targets with rank-gaussian normalization and 156-era folds
- Applied feature neutralization at 0.5 proportion via pseudoinverse projection to maximize Meta Model Contribution score
- Validated with expanding-window walk-forward CV using 8-era purge gap for overlapping return data, achieving 92nd percentile

ADDITIONAL INFORMATION

Additional Activities: Point72 Academy Case, Citadel APAC Datathon, IQC, Emory Calisthenics Group, Sigma Chi Fraternity
Honors & Awards: NumerAI 843/10k, HackATL 2025 9th, ETHDenver 2025 6th Poker Round, Akuna Capital HackerRank 217/3k
Skills: Python, C-family, SQLite, ML Algorithmic Trading, Type 115 wpm, MS Office, VBA, Portuguese, English, Spanish
Interests: Climb K2, Classical Music, European Soccer, Surfing & Sailing, Chess, Poker & Counting Cards, Scuba Diving