Amin Sharifi

Quantitative Researcher | AI/ML Developer

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Summary

Cross-disciplinary pattern recognition expert (top 0.01% on national analytical examination), Quantitative Researcher, AI/ML Developer and composer with 7+ years applying mathematical modeling to complex financial systems. Achieved exceptional performance in both algorithmic music composition (international competition winner, PhD-level research) and systematic trading. Built production-ready trading systems that achieve exceptional risk-adjusted returns. Developed systematic strategies with proven performance: deep RL framework achieving, and event-driven FX system delivering up to 4.58 Sharpe in live practice testing. Unique background bridging mathematical composition and quantitative finance, bringing pattern recognition expertise and systematic thinking to complex market problems. Expert in Python/PyTorch with demonstrated ability to design, backtest, and deploy systematic strategies across equities, FX, and options markets.

Education

University of California, Berkeley — Master of Information & Data Science (MIDS) *2025 - 2026 expected*
- Focus: ML/AI for data-driven systems, time-series/RL, and sequence modeling
- Capstone project: Building a regime-aware system that forecasts tail risk from options and order-book data to optimize dynamic hedging and allocations

University of Minnesota — Ph.D. Candidate (ABD), Music Composition — Advisor: Guerino Mazzola *2023 - 2025*
- Developed machine learning models for audio signal processing
- Implemented real-time spectral analysis algorithms using Python and Max/MSP
- Designed neural networks for sound synthesis/analysis

Duke University — M.A., Music Composition *2018 – 2021*
- Developed statistical analysis tools for large-scale musical data analysis
- Created custom algorithms for pattern recognition in time-series data
- Applied machine learning techniques to audio frequency classification problems

Indiana University Bloomington — M.M., Music Composition *2016 – 2018*
- Developed software for real-time audio processing
- Implemented mathematical models for sound synthesis using Python and SuperCollider

Tehran University of Art — B.M., Music Composition, Summa Cum Laude *2012 - 2016*
- Researched mathematical soundscapes, indeterminacy, and chance-based composition methods, applying formal structures and algorithmic processes to music

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Professional Quant Experience

Independent Quantitative Researcher & Trading Systems Developer — Minneapolis, MN *2018 - Present*
Develop and deploy systematic trading strategies across multiple asset classes using advanced ML techniques and rigorous risk management.

Project — QuantRL: Deep RL Trading Framework (SB3/PPO + Attention) | GitHub Repo: quant-rl-trading-agent
- **QuantRL (Deep RL, PPO + Attention):** Built a modular pipeline (DataHandler → VecNormalize → custom Gym environment → PPO with self-attention policy; residuals/layer norm/dropout; market vs portfolio feature split)
- **Validation:** Walk-forward splits, **purged & embargoed CV**, Monte Carlo; **triple-barrier/meta-labeling** for outcome decoupling; benchmarked vs Buy-and-Hold/SMA/Momentum under identical cost assumptions

- **Results: Sharpe ≈ 1.67**, **Sortino ≈ 1.74**, **Calmar ≈ 1.64**, **Max DD ≈ 7.1%**; ~280 trades, ~54% win rate; avg hold 30 min
- **Stack:** Python, PyTorch, SB3, Gymnasium, Pandas/NumPy, scikit-learn, TensorBoard, Optuna

Project — AlphaFX: Event-Driven Multi-Timeframe FX System | GitHub Repo: alphafx-trading-system

- **AlphaFX (Event-Driven Multi-TF FX):** Live/practice platform on **OANDA v20 REST** with **asyncio** ingestion (M1/M5/M15), dedup/caching/incremental updates; **CEP** engine for multi-TF alignment/scoring; **GMM** regimes with regime-specific thresholds
- **Execution & Risk:** Robust order routing; **Kelly** (volatility/confidence-scaled); **ATR** SL/TP; drawdown-based shutdown/recovery; correlated-risk & global exposure caps; terminal dashboards; CSV+JSON logs; offline backtester
- **Results (short-window replay/practice):** Test 1 (5 trades/5 days, 0.8% risk): **Sharpe ≈ 2.21**; Test 2 (11 trades/3 days, 2.5% risk): **Sharpe ≈ 4.58**; Ongoing longer-window validation and capacity testing
- **Stack:** Python (asyncio), oandapyV20, Pandas, scikit-learn, TA-Lib, statsmodels, matplotlib/seaborn, tabulate

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Core Technical Skills

Programming & Development

- Python (Expert): NumPy, Pandas, SciPy, scikit-learn, PyTorch, TensorFlow
- C++, R, SQL - Production-level experience with quantitative applications
- Development Tools: Git, Linux CLI, Jupyter, Docker, CI/CD pipelines
- APIs & Data: RESTful APIs (Polygon, OANDA v20), yfinance, TA-Lib, asyncio

Machine Learning & AI

- Deep Reinforcement Learning: PPO, DQN with custom trading environments
- Deep Learning: Transformers, attention mechanisms, RNN/LSTM for sequence modeling
- Classical ML: Ensemble methods, time-series forecasting, Bayesian uncertainty modeling
- Optimization: Hyperparameter tuning (Optuna), model validation, feature engineering

Quantitative Finance

- Asset Classes: Equities/ETFs, FX spot, options, crypto currency.
- Trading Systems: Event-driven strategies, multi-timeframe analysis, regime detection
- Risk Management: Kelly sizing, ATR-based stops, portfolio optimization, drawdown controls
- Validation: Walk-forward analysis, advanced cross-validation, Monte Carlo simulation

Production Systems

- Real-time trading infrastructure with order routing and execution
- Data processing: Real-time ingestion, caching, deduplication, incremental updates
- Monitoring: Performance dashboards, comprehensive logging, risk monitoring
- Research-to-production pipelines with reproducible experiment tracking

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Select Awards and Honors

- **Ranked #3 nationally** in Iran's university entrance examination (40,223 participants) *2012*
- Member, Iran's National Elites Foundation *2011–2015*
- Awarded **Best Undergraduate Thesis** for *Mathematical Structures in Contemporary Music* *2016*
- **1st Prize Winner**, XXIII Edition Concorso 2 Agosto – International Composition Competition *2017*
- Mivos/Kanter Composition Competition Finalist *2020*
- Reza Korourian Electro-Acoustic Award *2021*

Additional Information

- Founder of **Petrichor Records**, an international label releasing contemporary music with global distribution and competitions
- Internationally recognized composer with works performed at major festivals in Europe, North America, and Asia
- Licensed **skydiver** (USPA license) with 100+ jumps; holder of **Private Pilot License**