Timofey Generalov

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EDUCATION

The University of British Columbia (UBC)   Vancouver, BC
Bachelor of Science, Major in Mathematics, Minor in Economics   **Expected April 2028**
- **Concentration:** Mathematics of Information
- **Relevant Coursework:** Matrix Algebra, Calculus III, Mathematical Proof, Differential Equations, Probability, Data Science. *(Upcoming: Stochastic Processes, Real Analysis, Linear Programming, Econometrics I & II)*

PROJECTS

News Sentiment & Volatility Prediction Model   *Python, Scikit-Learn, FinBERT, Numba*
- Developed a Logistic Regression model to predict "4-sigma" volatility jumps in intraday equity data, achieving a **0.8711 AUC** by fusing news sentiment with price-action features.
- Engineered a high-dimensional feature set including FinBERT sentiment scores, BART-based topic tags, and an SVM Anomaly Score to quantify news-driven market surprises.
- Applied Principal Component Analysis (PCA) to reduce 768-dimension BERT embeddings into 10 key vectors, capturing latent news themes while preventing model overfitting.
- Simulated market realism via Walk-Forward Optimization over two years of data, incorporating Numba-accelerated slippage models, partial fill logic, and transaction costs.
- **Result:** Validated model stability across 24 months of unseen data using a rolling-window analysis, maintaining consistent positive alpha across diverse volatility regimes.

Dual-AI Forex Strategy: LSTM Scout & RL Manager   *PyTorch, Stable-Baselines3, OANDA API*
- Architected a two-part autonomous system for identifying and managing high-probability reversal patterns on the GBP/JPY pair.
- **Scout:** Built a multi-head LSTM model in PyTorch for multi-task learning to predict trade quality, reward-to-risk ratios, and failure probabilities.
- **Manager:** Trained a Reinforcement Learning agent (PPO) in a custom Gymnasium environment to determine optimal exit policies for active positions.
- Integrated an Explainable AI (XAI) pipeline using SHAP to identify the top market features influencing LSTM predictions.
- Developed a hybrid feature engineering process combining technical indicators with DBSCAN-based liquidity zone detection.

Quantitative Equity & Derivatives Analysis Platform   *Python, Pandas, NumPy*
- Engineered a desktop workstation integrating eight specialized modules for equity and derivatives trading, from idea generation to portfolio risk management.
- Implemented a Monte Carlo engine featuring Heston, Jump-Diffusion, and Rough Bergomi models for advanced options pricing and risk modeling.
- Built a comprehensive Greek sensitivity dashboard to monitor first and second order risks ($\Delta, \Gamma, \mathcal{V}$) across multi-leg options portfolios.
- Developed an event-driven Strategy Tester with parameter sweeps and performance metrics, benchmarked against SPY.
- Integrated a standalone portfolio suite featuring Value-at-Risk (VaR), rolling volatility, and crash stress tests.

SKILLS

- **Programming & Development:** Python, GitHub, Numba (HPC), Tkinter, Matplotlib
- **Quantitative & Machine Learning:** Pandas, NumPy, Scikit-learn, PyTorch, Stable-Baselines3, Gymnasium, SHAP
- **Financial Concepts:** Algorithmic Trading, Derivatives Pricing (Greeks), Stochastic Modeling, Backtesting, Risk Management (VaR), Portfolio Analysis

CERTIFICATIONS

- **Machine Learning for Trading** – Google Cloud & New York Institute of Finance (Coursera)
- **Financial Markets** – Yale University (Coursera)