ZHAOLI CAO

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EDUCATION

The University of Hong Kong **Hong Kong, China**
Master of Finance in Financial Technology 2025.09 – 2026.11
• **Honors:** Vice President of the HKU Elite Club (Fintech) | **GPA: 3.925/4.0**

Fudan University **Shanghai, China**
Bachelor of Science in Mathematics (Minor:Economics & Finance) 2020.09 – 2025.06
• **Core courses:** Mathematical Modeling, Numerical Solution of Differential Equations, Real Analysis, Complex Analysis, Probability Theory and Mathematical Statistics, Ordinary Differential Equations, Financial Engineering, Econometrics, Python
• **Honors:** First-Class Scholarship of Fudan University(2024), WorldQuant Challenge Gold Medal(2025), IMC Prosperity3 Global Top 2% (2025), Kaggle Crypto Market Prediction Top 10% (2025), MCM Meritorious Winner (2023)

PROFESSIONAL EXPERIENCE

Matrixport, Quantitative Trader Hong Kong, Sep 2025 – Nov 2025
Conducted crypto microstructure research, focusing on L2 signal extraction and multi-frequency factor modeling.
- **Microstructure & Regime Detection:** Based on L2 order book and funding rate data, extracted market microstructure features and employed a Hidden Markov Model to identify latent market states, enabling dynamic signal adaptation.
- **Multimodal Temporal Modeling:** Optimized an end-to-end time-series modeling framework that integrates L2 order book data with NLP-based sentiment features, utilizing LSTM/Transformer to capture market dynamics.

Geek Union Fund, Quantitative Research Shanghai, Jun 2025 – Aug 2025
Responsible for factor mining on daily and hourly CTA data, as well as multi-window factor training and portfolio construction.
- **Factor Mining:** Conducted daily/hourly CTA factor research via multi-window training, dynamic smoothing, and IC–return filtering to build a library of 80+ signals. Applied regime-sensitive sampling to improve robustness across market states
- **Operator Development:** Refactored core signal modules, achieving ~77% runtime improvement via Numba JIT and pybind11-based C++ extensions with SIMD (AVX2). Integrated multi-horizon operators, cross-sectional allocation, and risk-budget weighting to speed up tuning and portfolio construction
- **Loss & Statistical Regularization:** Designed a robust loss (winsorization, Huber, directional penalties) and applied Newey–West adjustments to address heteroskedasticity and autocorrelation in factor evaluation
- **Rule-Based Features & Portfolio:** Extracted rule-based K-line features (IC up to 0.12) and built multi-factor portfolios using SGD-based allocation + KMeans, achieving Sharpe 2.64 / Calmar 4.15 out-of-sample

KR Capital, Quantitative Research Shanghai, Jan 2025 – May 2025
Responsible for CTA strategy and stock strategy research, backtesting, and deployment in simulation and live trading
- **Cross-Sectional Futures Alpha:** Built minute-level multi-factor long–short strategies using roll yield, basis momentum, and other high-frequency features. Applied XGBoost with feature-importance weighting and Newey–West residual adjustments, achieving Sharpe 1.78, max drawdown 9.6%
- **Global Regime Rotation:** Developed momentum-based ETF rotation strategies for volatile, regime-switching markets. Used GMM + EM to cluster regimes and dynamically adjust allocations. Two-month simulations achieved Sharpe 2.65 with controlled drawdowns and were deployed live on Ptrade
- **High-Frequency Statistical Arbitrage:** Identified cointegrated TSLA-NVDA pairs via 5-min bars. Engineered a dynamic-β hedged Z-score signal with rolling GLS regression, achieving a backtest Sharpe of 3.435.

PROJECT EXPERIENCE

IMC Trading Prosperity3 High-Frequency Trading Competition (Global Top 2%) Apr 2025
Served as team leader, overseeing case studies and strategy development; led quantitative strategy design and manual trading
- Strategies included: order book market making (spread & inventory control), ETF premium arbitrage (intra-day dislocations), options mispricing via Black–Scholes/IV bias, cross-asset relative value, and signal-based momentum following.

Fake News Detection Based on Natural Language Processing(MIT-supervised project) Mar 2025 - May 2025
Integrated RoBERTa and XLNet, improving classification performance via five-fold cross-validation.
- Designed an uncertainty-based pseudo-labeling algorithm combined with label smoothing, consistency regularization, and learning rate warmup to stabilize semi-supervised training, achieving F1 = 0.985.
- Error analysis and ensemble calibration, comparing soft/hard voting and stacking meta-ensembles for model selection.

Bitcoin Price Prediction and Quantitative Trading Strategy Based on Machine Learning Feb 2025 - May 2025
Constructed bitcoin price prediction model and designed optimized quantitative trading strategy
- Developed a multi-model prediction framework with feature engineering on adjusted Bitcoin price series. Integrated regime segmentation and feature drift detection to enhance model adaptability across market states.
- Bayesian optimization + walk-forward backtesting + transaction cost modeling for multi-factor strategy (Sharpe 2.704)

SKILLS

Programming: Python (NumPy, Pandas, Matplotlib, QuantLib, Pytorch, Tensorflow), Linux, C++, R, MATLAB, LATEX
Language: Chinese (native), English (fluent, TOEFL: 109 (Reading: 30; Listening: 29; Speaking: 25; Writing: 25))

曹肇立

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教育背景

香港大学，金融科技 丨GPA(3.925/4.0) 香港，2025.09 - 2027.06

· 荣誉职位: 香港大学精英协会 金融科技协会副会长

复旦大学，数学与应用数学（辅修专业：经济学&金融学） 上海，2020.09 - 2025.06

· 核心课程: 金融工程、随机分析、微分方程数值解、实分析、复分析、概率论与数理统计、计量经济学、Python

· 荣誉奖项: Kaggle Crypto Market Prediction 全球前10%(2025) 、WorldQuant金牌(2025)、高频交易比赛IMC Prosperity 全球前2% (2025)、美赛M奖 (2023)、 复旦大学专业奖学金

实习经历

Matrixport，量化交易 香港，2025.09 – 2025.11

负责Crypto市场的量化研究与交易，高频因子挖掘、验证与优化

· 基于L2订单簿与资金费率数据提取盘口特征，采用隐马尔可夫模型识别隐含状态，以实现信号动态适应

· 优化端到端时序建模框架，融合L2订单簿数据与NLP情绪特征，通过LSTM/Transformer捕捉市场动态模式

积优基金，量化研究 上海，2025.06 – 2025.08

CTA日频及小时频因子挖掘、因子多窗口期训练及组合

· 单因子训练： CTA日频与小时频因子研究，运用多窗口期信号训练与动态平滑算子，结合IC-收益联合筛选，构建涵盖80+信号的因子库，并引入状态分层采样提升因子在异质市场状态下的稳健性

· 框架优化：重构底层信号模块，通过 Numba JIT 加速与Pytorch加速，采用 SIMD(AVX2)向量化优化，运行效率提升约 77%。引入多周期预测算子、横截面分配与风险预算权重机制，加速超参数调优与多因子组合生成

· 损失函数及统计修正： 设计自定义损失函数，结合95分位数winsorize、Huber Loss与方向一致性惩罚，增强异常值鲁棒性与信号稳健性；在因子评估中引入Newey‐West回归修正，应对异方差与自相关问题

· 规则类与多因子组合： 基于K线模式提取规则类特征，单因子IC值0.12；采用基于SGD的base分钱方法与Kmeans聚类构建多因子组合，五因子组合在超样本中实现Sharpe 2.64、Calmar 4.15

KR Capital ，量化研究 上海，2025.01 – 2025.05

负责期货截面策略和股票量化策略的研究回测及模拟盘实盘部署

· 期货截面Alpha建模： 基于分钟级期货数据构建多因子多空策略，结合展期收益率、基差动量等因子，使用XGBoost+特征重要性动态权重+Newey‐West残差修正，实现夏普1.78、最大回撤9.6%

· 全球宏观轮动策略： 针对高波动、状态频繁切换的市场环境，利用GMM+EM聚类划分市场状态并动态调整ETF配置，两个月模拟盘Sharpe 2.65，回撤可控，已在Ptrade成功实盘部署

· 高频统计套利： 针对TSLA与NVDA的5分钟K线识别价格-成交量协整关系，利用滚动回归和GLS估计构建动态β对冲的Z-score信号，并进行残差平稳性与异方差调整，回测Sharpe达3.435

项目经历

IMC Prosperity3高频交易竞赛（全球前2%） 上海，2025.04

担任队长，带领团队学习往年案例，分析数据，构建并优化策略，并负责开发量化策略及所有手动交易

·构建基于订单簿深度与价格波动的做市报价模型、利用ETF市场价与组件净值间价差的跨品种套利机制、结合Black-Scholes期权定价与隐含波动率偏差的定价套利模型、基于协整与价差Z-score构造的跨资产价差回归策略

基于自然语言处理的假新闻检测（MIT课题） 上海，2025.03 – 2025.05

结合RoBERTa、XLNet等预训练模型与传统机器学习方法，通过五折交叉验证提升分类性能

· 设计并应用伪标签算法进行数据增强，引入标签平滑与学习率预热等训练策略，使模型F1分数提升至0.985

· 开展误差分析与模型校准，对比软投票、硬投票与stacking meta-ensemble的性能差异，为不同应用场景提供最优模型选择方案

基于机器学习的比特币价格预测与量化交易策略研究（优秀毕业论文） 上海，2025.02 – 2025.05

构建比特币价格预测模型，并设计优化的量化交易策略

· 构建多模型预测框架，对复权价格序列进行特征工程，引入市场状态划分与特征漂移检测，准确率提升37%

· 采用贝叶斯超参数优化与滚动回测，结合交易成本建模，设计多因子量化策略，策略 Sharpe 比率达 2.704

个人技能

编程语言: Python(NumPy、Pandas、Numba、Pytorch、Tensorflow)、Linux、C++、R、MATLAB、LaTeX

语言能力: 中文(母语)、英文(流利，TOEFL: 109；阅读: 30，听力: 29，口语: 25，写作: 25)