Shadaab Ahmed

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- **Web:** https://github.com/SH-Ahmed17
- **Experience:** 4.5+ YOE

Education

08/2024 – present
Online

Master of Science | Financial Engineering
WorldQuant University

08/2022 – 07/2024
Online

Master of Technology | Software Engineering
Birla Institute of Technology and Science, Pilani, India

06/2017 – 04/2021
India

Bachelor of Technology | Chemical Engineering
National Institute of Technology, India

Work Experience

08/2022 – present
Delhi, India

Backend/Data Engineer
WinZO
Order Management System and Trading Infrastructure

- Architected Go-based **OMS** handling equity and F&O order lifecycle (regular, bracket, cover, iceberg, multi-leg spreads) with real-time validation against NSE/BSE price bands. Integrated **Black-Scholes Greeks computation** and **SPAN margin estimation**; functioned as enrichment proxy between trading UI and broker APIs. Validated end-to-end integration through UAT testing.
- Built high-performance C++ market data feed service ingesting tick data from data vendors via **UDP multicast channels**. Implemented **LZO/delta decompression** and **lock-free SPSC queues** for optimal throughput; WebSocket redistribution to downstream trading systems. Achieved **sub-5ms latency at 50K+ ticks/second**—enabling real-time market data for trading strategies.
- Developed **real-time OHLCV aggregation service**, consuming tick streams to construct 1-min, 15-min, and daily candles across exchange equity and F&O segments. Persisted aggregated data to QuestDB for backtesting and analytics, enabling downstream services to access pre-computed market structure data.
- Engineered **asynchronous backtesting orchestration** using Kafka for strategy job queuing and Redis for result caching. Built paginated trade log API with P&L summaries, handling concurrent backtesting requests while maintaining sub-second result retrieval and consistent state management.
- Built a **strategy backtesting** and signal generation system integrating real-time market data feeds, enabling quantitative validation of trading strategies with performance metrics (returns, Sharpe ratio, max drawdown) and automated signal generation with entry/exit recommendations.

Data Engineering & Infrastructure

- Architected high-throughput Spark and Kafka pipelines processing **200+ TB** daily, supporting **100M+ transactions/day** with **30% latency reduction**. Deployed real-time **data ingestion** with automated validation and deduplication (600M+ daily updates on AWS ECS), achieving 15% resource optimization for analytics and reporting.
- Developed **Terraform modules** enabling one-click **EMR cluster provisioning**—automating core/task node configuration with pre-configured YARN/Hadoop properties, bootstrap scripts, library dependencies, and New Relic monitoring agents. **Reduced cluster recovery time from 2+ hours to under 15 minutes (87% improvement)**
- Managed migration of batch analytics pipelines to Kubernetes and Docker, reducing infrastructure **costs by 25%**. Implemented real-time monitoring with Prometheus and Grafana, increasing **system uptime by 45%** and ensuring data pipeline reliability for downstream analytics teams.

Work Experience

08/2025 – 09/2025
Part-time, Remote

Quantitative Analyst Intern
Oakcean Capital

- Developed **statistical arbitrage engine** (**pairs trading**, Shanghai Stock Exchange) implementing **cointegration tests** (Engle-Granger, Johansen), **Hurst exponent, z-score signal generation**.
- Simulated execution algorithms (**TWAP, VWAP, dark pool routing**). Analyzed market microstructure, market impact estimation (square-root model), venue selection.
- Implemented **C++ power method (SVD) with Python bindings** for matrix decomposition (in-house analytics).
- Analyzed **USD/EUR interest rate derivatives (SOFR futures, Fed Funds)**. Developed rate strategy positioning, market outlook analysis.

05/2021 – 08/2022
Pune, India

Data Engineer
SG Analytics

- Built scalable ETL pipelines AWS Redshift (structured/semi-structured data), 20% reliability improvement. Automated Python workflows, eliminating manual steps, 30% productivity gain. Optimized SQL queries, 50% speedup. Built Tableau dashboards (actionable insights), enabling data-driven decisions.

Skills

– LANGUAGES

Python | Go | C++ | SQL

– DATA & SYSTEMS

Kafka | Spark | Change Data Capture | Docker

Kubernetes | Terraform | CI/CD

Projects

Heston Options Pricing Engine
Python, Go, FFT, Microservices

- Engineered **Heston stochastic volatility pricing engine** implementing **FFT** (Carr-Madan) achieving **5ms latency (200x faster than Monte Carlo)**. Implemented two-stage calibration (Differential Evolution + L-BFGS-B) with **RMSE <0.5%** across **volatility surface in <3 seconds.**
- Built **microservices architecture** (Python Flask, Go, Redis, PostgreSQL) supporting **concurrent Greeks calculations (Delta, Gamma, Vega, Theta, Rho), handling <10ms API response with >99.5% accuracy** (FFT vs Monte Carlo validation).

Regime-Based Dynamic Asset Allocation Engine
Python, HMM, Stochastic Modeling

- Engineered systematic trading strategy using **Hidden Markov Models detecting market volatility** regimes across 20+ years backtesting. Achieved Sharpe Ratio >1.0, 65% drawdown reduction through **dynamic allocation** (equities, bonds, gold).
- Built **backtesting engine with 1-day execution lag** (prevents look-ahead bias), **AIC/BIC model selection for regime optimization.**