ADITYA BAKSHI

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PROFESSIONAL EXPERIENCE

MASS MUTUAL, New York, USA
Investment Quantitative Developer **Jul, 2025 – Present**

- Designed and implemented statistical models and data pipelines for a $285B investment account, supporting hedging, pricing, and asset allocation strategies across fixed-income ETFs, structured credit, and derivatives.
- Collaborated with portfolio managers and strategists to develop front-office tools, integrating Python, Docker, and GitHub workflows to streamline research, risk analytics, and investment decision-making.

ENDLESS FRONTIER LABS , New York, USA
Research Analyst **Jun, 2024 – May, 2025**

- Designed scalable data pipelines in Python and SQL, automating financial data extraction and transformation.
- Built and maintained the organization's website, integrating dynamic content updates and interactive financial analytics tools.

ESTEE ADVISORS, Gurugram, India
Quantitative Researcher **Jan, 2023 – Aug, 2023**

- Created long-only multi factor quant models for signal generation in Asian equities (India & Hong Kong), with medium term rebalance period (1 month)
- Applied machine learning models to macroeconomic, technical, and alternative data (including Bloomberg, Twitter) to generate predictive analytics and track performance for managing a $24.3M investment portfolio.
- Pioneered progressive stock selection trials encompassing Higher-Order Factors, PCA Regression, Custom Sector Grouping
- Performed consistently by achieving >1% monthly alpha, high Sharpe, and low volatility [*Estee PMS Dashboard*]

Senior Software Engineer – Trading Middleware **Jul, 2021 – Jan, 2023**

- Designed and implemented a real-time risk engine capable of sub-millisecond recalibration, enabling dynamic exposure adjustments in volatile market conditions including tools for pre and post trade risk management, including limit setting, monitoring and alerting systems.
- Built an event-driven strategy builder and execution engine using Node.js, FastAPI, C++, and SQL, supporting the creation, simulation, and deployment of algorithmic trading strategies.
- Engineered low-latency trading middleware for high-frequency trading (HFT), achieving execution latencies as low as 5.9µs for institutional traders.
- Led cross-functional integration by designing and maintaining REST APIs, WebSocket services, and backend communication through RabbitMQ, ensuring seamless collaboration between frontend and backend teams.
- Directed a team of 3 engineers to enhance execution performance, reduce API latency, and increase fault tolerance, resulting in significantly processing throughput. [*STrade Trading Platform*]

Software Engineer – Investment Platform **Aug, 2020 – Jul, 2021**

- Engineered a highly scalable, event-driven investment advisory platform, ‘Gulaq’ using FastAPI, AWS and MySQL delivering real-time portfolio insights and management service to 100K+ retail users.
- Built a resilient microservices architecture using AWS SQS for asynchronous communication, AWS Lambda for serverless compute, and distributed state management.
- Developed high-performance REST APIs with distributed cloud computing, leveraging parallel processing, in-memory caching (Redis) to optimize data ingestion and improve response speed. [*Gulaq Advisory Platform*]

SKILLS

Tech Stack: Python, C++, JavaScript, FastAPI, Node.js, React, Git, Linux
Systems & Tools: AWS, Firebase, Docker, Redis, RabbitMQ, Kafka, SQL, OAuth2, CI/CD, REST, WebSockets
Specialties: ML (TensorFlow, Transformers, LLMs), Blockchain, Distributed Systems

EDUCATION

NEW YORK UNIVERSITY New York, USA
Masters of Science (MS) in Financial Engineering **Aug, 2023 – May, 2025**
GPA: 3.6/4.0 **Graduated**

- **Teaching Assistant:** Machine Learning, NLP & Investment Process, Advanced Deep Learning

NETAJI SUBHASH INSTITUTE OF TECHNOLOGY Delhi, India
Bachelor of Engineering (BE) in Electronics and Communication **Aug 2016 – Aug, 2020**
GPA: 7.6/10 **Graduated**

CERTIFICATIONS

- **Financial Risk Manager (GARP FRM®) -** Level 1, Earned elite distinction (ranking among top 5% globally)
- **NISM series-XVI: Commodity Derivative,** Scored: 92.7%
- **Bloomberg Market Concepts Certification**

PROJECTS & RESEARCH

Real-time Mock Trading and Analytics Engine [*Live Demo*]
- Developed a platform (FastAPI, PostgreSQL, AWS) enabling real-time mock trading, risk analytics, and portfolio optimization.
- Integrated a fine-tuned LLM to deliver automated, precise, and actionable portfolio insights, enhancing decision-making.
- Designed an advanced priority-based WebSocket rotation algorithm with in-memory caching and concurrency, achieving real-time market data updates (<500ms) for S&P 500 stocks while reducing data provider and server costs to $0.
- Built scalable APIs and fault-tolerant cloud architecture on AWS, ensuring high availability and resilience under extreme loads.

Large-Scale Time-Series Order Book Data Warehouse [*GitHub Repo*]
- Created a high-performance market data warehouse in C++ (C++17), enabling efficient data ingestion, storage, and retrieval of large-scale order book data using fixed-size binary snapshots for fast random access.
- Developed a multithreaded query engine using binary search indexing and parallel processing, enabling fast order book lookups.
- Built a concurrent order book system with STL, multithreading, and mutex-protected logging for efficient bid/ask updates.

LoRA Enhanced LLM Fine-Tuning for Market Analysis & Sentiment Modeling [*GitHub Repo*]
- Fine-tuned LLM with LoRA for market analysis and sentiment modeling, improving efficiency and reducing computational cost.
- Optimized training pipelines with quantization-aware tuning and adaptive learning rates, improving performance and efficiency.

Decentralized Governance Framework with ETH Blockchain [*GitHub Repo*]
- Built a DAO on Ethereum with smart contracts for decentralized governance, enabling proposals, voting and execution.
- Developed "AdityaToken" (ADI), an ERC20 token, for secure and democratic voting within the DAO.

Cryptocurrency Momentum Algorithmic Trader [*GitHub Repo*]
- Conducted Backtesting to exploring the dynamics of crypto market, providing insights into short & long-term trading strategies.
- Executed momentum-based (python) BTC strategy with 40% ROI and robustness checks using bootstrapping.

Valuation of Asian Option on Oil Futures [*Project Link*]
- Applied GBM and Monte Carlo simulations for valuing Asian options, analyzing 10,000+ scenarios to tackle market volatility
- Leveraged statistical analysis for risk analysis in oil futures trading, improving commodities investment strategies

EXTRACURRICULAR ACTIVITIES

- Avid chess player and college team captain, securing victories in numerous intercollege and national tournaments
- Open source and Indie Game Developer with a user base of over 2,500 and 4.5-star ratings on the app store. [*GitHub Repo*]