ZAHID HOSSAIN

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EDUCATION

● **Masters** in computer & electrical engineering (with thesis paper published), University of South Alabama, **USA**

● **Bachelors** in computer engineering, University of South Alabama, **USA**

PROFILE

17+ years of hands-on development and leadership experience at top-tier investment banks and hedge funds in **London** and **New York**, specializing in ultra-low-latency electronic trading, RFQ, market making, quantitative trading and smart execution. Author of a **Java low-latency book** with expertise in high-performance Java, real-time pricing, market data, risk and P&L systems, Unix tuning, and kernel-bypass networking for microsecond execution.

ACHIEVEMENTS

● Achieved **Exceptional Rating (1*)** at Citi 2019 (only developer to receive it in Equities)
● Author of "**Java: How Low Can You Go — Low-Latency Design for RFQ and High-Frequency Trading** (Java 24+ and Beyond)".
● Jefferies ranked 1 in European high yield, built that RFQ no-touch trading systems.
● Innovative and think outside the box, never bind to working hours, always thrive for success
● Topper in college with a GPA of 4.0/4.0 with published papers in Masters.

CORE TECHNOLOGIES

- Languages: **Java Low Latency,** C#, Python, C++, SCALA, ReactJS, Angular 6+, Ab Initio
- Asset classes: Fixed Income, Swaps, CDS, FRA, Eq. Derivatives, Cash, FX.
- Frameworks: Apache Kafka, AKKA, WPF, Scala Play framework, Python Flask, Angular IONIC, JavaScript
- Artificial intelligence: AI – LLM, Agentic AI, Fine Tuning, Lang Chain, Lang Graph, CrewAI, RAG, CNN, ANN, RNN - time series, NLP with Python TensorFlow, PyTorch, NumPy, scikit-learn.
- Technologies: Elasticsearch stack, OpenShift docker, Git, TFS, **Docker** Swarm, **Kubernetes**, FaaS, Lambda
- Databases: **KDB q+**, MongoDB, SQL, Sybase, LINQ to SQL, (SSRS), ORACLE 8/9/10g PL/SQL and DB2.

PROFESSIONAL OVERVIEW

- Hands-on development and leadership experience in **New York** and **London** within financial institutions. Proficient in architecting low-latency trading systems in Java, C#, Python, React JS, and Scala using modern frameworks. Specialized in end-to-end e-Trading platforms - market data handling and smart order routing, FIX protocol integration, OMS, and EMS development.
- Expert in developing and architecting **ultra-low-latency**, zero-GC Java applications with deep expertise in **JVM tuning, off-heap memory** management, and **lock-free** data structures. Skilled in leveraging high-performance frameworks such as the Lmax's Disruptor, **Chronicle Queue**, **Aeron**, **Agrona Ring** for inter-thread and inter-process communication. Strong understanding of **Linux internals**, Linux Tuning, Memory management & caches with nano-second level latency, primitive collections such as fastUtil, HPCC, eclipse, **TCP tuning**, **NIC configuration**, and **kernel-bypass** networking for microsecond-level performance.
- Passionate about Algorithms, Data Structures, Data Analysis, Data Science, Quantitative Development, Algorithmic Trading, Pricing, and Risk Management. Expert in pricing any swap, exotic derivates, generating vol surface as well as scenario-based risk analysis.
- Customize **quant libraries**, including adapting open-source libraries like **QuantLib** (C++) and OpenGamma (Java), to meet specific derivative types, extending functionality for tailored OTC products, extension for XVA risk analysis.

WORK EXPERIENCE

State Street, Charles River IMS, London | 2024 – present
Team Lead Consulting, (OTC Derivatives, FI, Equities, OMS, EMS)
- Implemented functionalities within the Charles River Investment Management Solution (IMS), one of the world's leading **trading systems (crd.com)**, currently *managing $60 Trillion USD*. Focused on Fixed Income (FI) OTC derivatives order and execution management, buy-side trading with FIX connectivity, integrating with platforms like Tradeweb (TW) and Bloomberg (BBG). Enhanced capabilities for handling competitive quotes from multiple dealers, improving the trading system's manager workbench, Execution Management System (EMS), and Order Management System (OMS).
- Developing replacement of FINCAD analytics library to in-house built library for pricing, calibrating and scenario analysis for interest rate and credit products based on customizing QuantLib, OpenGamma for OTC derivs.

Jefferies, London | 2023 – 2024
SVP, Algo team lead, Fixed Income Quant Tech
- Led the development and architecture of an **RFQ** (Request for Quote) Complex **Auto Negotiation Engine** (CANE)/Auto Trading in **Java** in low latency approach from scratch.
  - Engine designed for Bond and bond ETF pricing to handle thousands of requests at a time in near real-time employing continuous optimization techniques while handling millions of tick data.
  - Successfully integrated CANE with leading financial platforms including ION, AMPS messaging, Bloomberg, Tradeweb, and other market participants, streamlining ETF processes.
  - Implement firmwide **VWAP & TWAP** pricing calculation and successfully integrated with CANE.
- Re-engineered the RFQ systems with deep JVM performance tuning, off-heap memory usage, and zero-GC approach. Reduced latency to microsecond level along with **Linux** (RHEL 7) and **network tuning**, resulting in a hit ratio increase from **30% to approximately 70%**, achieved award winning **fastest RFQ system in European market.**
- Developed a versatile producer-consumer using **python**.
  - Designed to support algorithmic **pricing** by connecting AMPS and ION platforms.
  - The application is utilized for a wide range of functions including trade flow support, pricing requests, and data publishing.

Citigroup, New York | 2016 – 2022
Head of Quant Dev (NAM)
Equities & Derivatives – RFQ Flow Desk
Market Making ETF Algo:
- Developed low-latency ETF market-making infrastructure handling real-time market data, basket valuation, and smart quoting to maintain tight spreads and NAV alignment, leveraging off-heap memory, lock-free patterns, and kernel-bypass networking.

Quant Team – Equities & Derivatives:
- Leading the equities quant team of North America Partnering with Citi's innovation NY Lab, building unified all in one Trading desk Web app using Java, React, Angular, Kafka, Spring boot, Kubernetes, Docker Swarm, Play framework. Converting all legacy excel based apps and services to new web apps with the most up to date technologies - a team of language-agnostic developers. Creating microservices supporting trading desk daily tasks including pricing for **no-touch RFQ tickets,** hedging strategies PnL, option Greeks hedging, Risk, Central Risk system, Listed and OTC, TOTEM, Broker quotes etc supporting for CIS, Exotic, sales & Trading, D1 desks. Pricing exotic options with binomial and black-Scholes model

Risk Team Equities:
- Built global derivatives risk application from concept, starting from framework design, front-end and Java backend include writing low level (IL) code in order to achieve the SOLID principle in the framework and make the framework universal for all other team globally. This risk system connects to column based KDB (low latency) and other services.

- Designed architecture and Developed framework for JAVA middle tier followed by developing REST service endpoints for risk application web front end with Java Spring along with some other frameworks.

Credit Suisse, New York | 2014 – 2016
Senior Consultant, *Equities Algo*
- Re-engineered a front-office equity algorithmic trading platform with a WPF front end integrated to the central order management system and multiple real-time services (pricing, credit, list, and short-locate). The platform supported global equity desks for basket trading and algorithmic strategies including **VWAP, TWAP** and **POV** execution, built using a hybrid Java and C++ stack for performance and scalability.
- Developed and optimized **Smart Order Routing (SOR)** and Dark Pool Matching Engine components (Crossfinder), improving execution quality, fill rates, and market-impact efficiency across multiple liquidity venues. Applications were tuned for low-latency.

Barclays, New York | 2011 – 2013
Fixed Income Swap Risk
- Worked on instruments- Plain vanilla Interest Rate Swap as well as OIS, Basis, Zero Coupon Swap and FRA (Forward Rate Agreement) – mostly on quantitative analysis on JAVA Server, C# front end
- Calculated risk of **500K swaps** in order to generate Initial Margin for CME and LCH. Calculations involve receiving daily rates for Bond, Swap, FRA, futures and other fixed income instruments for different tenor points and then construct the curves based on those points. Calculate the DV01 (delta) and PV01 from the curves and then calculate VAR with the scenario data for the last 1260 days and do the interpolation to get the worst-case loss to calculate initial margin. Taylor series expansion till second derivatives has been used (delta and gamma) for LCH. Calculation also involved currency risk and used 1260 days scenario rate to determine the risk per currency.

Bloomberg, New York | 2009 – 2010
Consultant/Developer
- A lead Designer/Implementer of two brand new tools (multi-threaded) from scratch with **C#** and core **Java** to prepare for large-scale growth in the coming years, including low-level data access, middle tier business logic, back-end data processing. The tools communicate with Bloomberg's general application service (BAS) via Internet communication Engine (**ICE**). Ice then communicates with the Java backend. BAS is written in **C++** that is used for writing any terminal application. Written unit test for the tools as well.
- Developed XML communication infrastructure from front end UI to BAS to the internet communication engine (ICE) to Java backend. Worked part of java backend and C++ for BAS changes for the applications.

Sculptor Capital Management, New York | 2007 – 2008
Consultant
- Developed part of the Reporting framework including click once application with Advent Geneva portfolio management and accounting platform using C#. Migrated some WinForms to WPF technology. Reporting includes cash, dividend/interest, FX, gross long/short term, margin, position, pricing, PL, Swap and tax lot reports.
- Developed real-time PNL tool that shows real-time PNL with various strategies. It also enables traders to view research reports by symbol, identifying potential crossing opportunities. Used C# platform powered by Infragistics virtual ultra-grid and DevExpress Data Grid, WCF and Bloomberg API.