Dhanjit Das

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With **10 years of experience** in fintech and building trading platforms, I have built **extremely low latency systems for HFTs**, and led development of **in-house trading platform for India's biggest broking firm.** I am now seeking to expand my technical expertise in a high-impact role.

Education

- **Indian Institute of Technology, Kharagpur**, — West Bengal, India
  B.Tech., Department of Computer Science and Engineering — July 2011 - April 2015

Work Experience

- **Groww** *Fintech, Broking* — Bengaluru
  Engineering Manager (Software Development Engineer-4) — June 2021-Present

  - Spearheaded Eevee, **in-house trading platform**, capable of supporting NSE and BSE orders, currently at mirrored load of **12 million orders a day**.
  - Managed a team of 6 developers to contribute to **0-to-1 product development**, making Eevee with high code quality, **80% test coverage**, **Integration Test Suite** and stable UAT/Simulation environment.
  - Achieved **99.99% accuracy** in Margin calculations with the existing system. Used as a fallback API.
  - Architected a **pre-RMS solution for market open** load, which reduced processing time **by 75%**.
  - Built NSE and BSE connection adapters, **handling 2000 orders per second** per instance.
  - Planned and executed the simulation readiness, charting out validation frameworks, rollout metrics. Formulated **noise-resilient step-wise Margin validation** framework **reducing noise by 60%**.
  - Ensured **incident-free BOD operations** for Eevee, handling Holdings, Positions, User Data, and Exchange information for active users of Eevee. Sustained **zero downtime** with only **one T1 incident**.
  - **Improved MTTD by >99%** by creating **alerting and monitoring dashboards** for the trading platform, including business and functional alerts, using **Pagerduty, Apache Superset, and Grafana**.
  - **Reduced MTTR by >80%**. Decreased incident recurrence rate with an incident management program and effective RCAs for Eevee, including reporting for **SEBI and LAMA Compliance** for NSE/BSE.
  - Created the **BOD reconciliation system** for Holdings, Positions and contracts, involved 3-way reconciliation. **Identified 4 T1 bugs** and **5 T1 BOD incidents**.
  - Built the **Dropcopy & Trade Download** system for NSE and BSE, with the ability to reduce bill posting time **by 2 hours**. This system has the future scope of enabling **real-time trade reconciliation**.
  - Led the development of the Trader Workstation (TWS), a frontend for Eevee that was **fully NSE/BSE audit-compliant** in 3 months. Attained MCX audit compliance **readiness in 1 week**.

- **SMC Global LLT** *HFT* — Bengaluru
  Senior Software Developer — Sep 2019 - May 2021

  - Experimented with multiple market book building implementations and developed a **sub-100ns orderbook implementation for NSE**. Also engineered variant implementations for different use cases, **decreasing processing time by 50%** compared to the existing implementation.
  - Constructed a tick-by-tick **market data visualizer** for analyzing market micro-structure **upto 2 million data points**. Overlaid with strategy order and trade information.
  - Optimized Black Scholes calculation using **vectorized/simd instructions** reducing compute time to **less than 300ns**.

- **iRage Broking Services LLP** *HFT* — Mumbai
  Core Developer — June 2015 - October 2018

  - *qlog: Quick logging framework* https://github.com/dhanjit/qlog
    * Engineered an extremely quick and flexible logging framework that achieved **sub-100 nanosecond timings** for practical use.
    * Every change was checked at the **assembly level instruction** while still maintaining purely **modern C++11** code without any obfuscating non-portable features.

- *TemplateStrategy: Framework to quickly write strategies*
  * Designed and deployed a trading strategy development framework, acting as the sole authority figure for its implementation. This resulted in a **decrease in time-to-go-live to 2 days**.
  * Provided ability to easily override default functionalities, **pure C++17 template** based framework.
  * Rewrote 3 strategies to take advantage of vectorization and SIMD paradigms. Significantly lowered tick to order out time **to 20% of previous time**.
- Lead developer of the modular reusable C++ components used in the trading platform. The project was an amalgam of various individually **designed modules like lock-free queues, thread pools**, etc.
- Responsible for implementing and improving **arbitrage strategies**, linear trading models, **trend followers**, and market making algorithms; increasing profitability by 600% over 2 years.
- Developed and executed an **Exchange Simulator** stub capable of handling **20,000 orders per second**, supporting both native protocols and FIX, across all segments of NSE, BSE and MCX.
- Maintained market data feed handler for **BSE EOBI** protocol with $< 1\mu s$ **latency**.
- Experience with working with Solarflare cards and onload, and achieving $< 900ns$ TCP socket R/W time.

- **Goldman Sachs**, Bangalore
  Technology Intern   May 2014 - June 2014

  - Met **80% accuracy** in identifying job failures by implementing prediction mechanisms and start time estimations for an **in-house process scheduler**.

Projects

- **The Stitcher, Mosaicing of Torn Documents**,
  Inter Hall Open Soft Competition   March 2014

  - Created a tool to **stitch torn newspapers** using a 2-step algorithm comprising local and global matching using OpenCV. Implemented global matching and utilized **gradient descent** to maximize curve similarity and area compatibility, achieving 81% accuracy.

- **Database Model for Probabilistic Relationships**,
  B.Tech Dissertation   Jan. 2014 - March 2015

  - Developed an application for **Clinical Decision Support**, as a proof of concept of the **probabilistic database model** in the medical domain. Involved using a two step Bayesian joint probability for diagnosis of diseases given a set of symptoms, followed by prescription.

- **Other Projects**,
  IIT Kharagpur   2012-2015

  - Led the open soft team to develop Graphite, a **graph plotting software**, in Python, capable of multiple simultaneous view of multiple plots, 3D plotting, and simple linear algebraic solutions.
  - Designed a **32-bit non pipelined single cycle RISC microprocessor**, modeled the instruction set, and implemented using **Verilog**.

Skills

- **Extremely proficient in C++** and systems programming. Good knowledge of modern C++ standards.

- Have experience with C#, Verilog, Java, Golang, Bash and Python for scripting purposes.

- Familiar with Kubernetes, Google Cloud, Helm, Kafka, ArgoCD, NATS, RocksDB, Micronaut, Apache Superset, Grafana and Istio.

- Capable of managing and leading multi-skilled developers for executing time critical projects, especially of 0-to-1 domain.