Nathan Axel

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EXPERIENCE

Junior C++ Software Engineer - Market Data & Execution
Jun. 2024 – Present

Grasshopper Asia — *Singapore*

- Investigated and reduced 90th percentile fill latency return path from 9ms to 1ms on Stock Exchange of Thailand (OUCH Protocol) by optimizing critical path-lines and LLC cache allocation through CAT and Linux's perf.
- Single-handedly built Drop Copy Viewer on Tokyo Stock Exchange using Arrowhead 4.0 protocol, enabling real-time order tracking, fill reconciliation, and emergency order cancellation capabilities.
- Co-Developed shared memory Protobuf storage system for active orders and fills in order execution application, significantly improving crash handling and latency performance by 10x.
- Identified and corrected risk limits calculation for immediately filled orders across OUCH/OMnet protocols used for Osaka, Thailand, and Singapore exchanges.
- Engineered real-time data-collection streaming nodes that broadcast matching price/quantity during Itayose Auction periods through Solace.
- Actively engaged in deploying and troubleshooting critical C++23 applications in production Linux environment.

C++ Software Engineer Intern
Feb. 2024 – May 2024

MS Capital — *Singapore*

- Developed market connectivity application for Binance market data subscription using libwebsockets

Slang & SecDB Software Engineer Intern
May 2023 – Jul. 2023

Goldman Sachs — *Singapore*

- Co-engineered high-performance code searching engine on 190 million lines of code for 17,000 engineers worldwide, reducing search time by 10x and index time by 3x compared to previous tool using *Elasticsearch*

Salesforce Jr. Solution Developer (Intern)
Jan 2023 – May 2023

F5 — *Singapore*

Software Engineer Intern
May 2022 – Aug. 2022

Anacle Systems Limited — *Singapore*

IT & Specialized Assurance Intern
May 2021 – Jul. 2021

Deloitte — *Singapore*

EDUCATION

Nanyang Technological University
Singapore

BEng in Computer Science (w/ second major in Business) — *Aug. 2020 – May 2024*

- Grade: Honours w/ Highest Distinction, Dean's List Award (Top 5% in cohort)
- Awarded Dr.Goh Keng Swee Scholarship (1 out of 3 in Asia), ASEAN Scholarship (1 out of 10 in Indonesia)

AWARDS & PROJECTS

Multi-Chain Energy Trading in Microgrids
Aug. 2023 – Mar. 2024

- Developed interoperable energy trading infrastructure in Solidity and Algorand's PyTeal, focusing on synchronization across multiple blockchain platforms
- Codebase: https://github.com/nathanaxel/FYP

Goldman Sachs Intern Hackathon 2023: Generative AI (First Place, Champion)
July 2023

- Spearheaded a multidisciplinary team of quantitative researchers and software developers to build portfolio tailoring system to recommend security assets during major live news using fine-tuned LLM model.

Optiver Ready Trader Go 2023 (Singapore Rank #1, World Rank #17 – #32)
March 2023

- Developed automated high frequency market-making algorithms in *C++* to maximise profits when two securities tracking the same index (Future & ETF) have different liquidity in their order books
- Codebase: https://github.com/nathanaxel/sicilian

TECHNICAL SKILLS

Languages: C++, Python