Jason Yi

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Education

University of North Carolina at Chapel Hill — Chapel Hill, NC

Bachelor of Science in Computer Science, Statistics | Dean's List — *Exp Graduation: Dec 2026*

- **TA**: Algorithms (F25, S25), System Fundamentals in C (F24), Data Structures and Analysis in Java (F23, S24)
- **Research**: Optimized TreeFARMS algorithm in **C++/ Python** to produce **Decision Trees** under Chudi Zhong
- **Coursework**: Operating Systems, Machine Learning, Algorithms, Databases, Stochastic Modeling, Probability

Experience

Scale AI — October 2025 – Present

Generative AI Intern — *Remote*

- Built a **C++** dataset validation utility to automate schema enforcement and integrity checks across open-source corpora, ensuring rigorous quality standards for high-complexity **LLM** data analysis benchmarks
- Evaluated **SOTA** model performance on the **Model Context Protocol (MCP)** by designing complex, tool-dependent prompt trajectories to isolate failure modes in **JSON** function calling and external API integration

Amazon Web Services — May 2025 – August 2025

Software Development Engineer Intern — *Seattle, WA*

- Built a scalable mock data generation system for **AWS Compute Optimizer** in **Kotlin** and **Python** with **AWS AppConfig**, **AWS Lambda**, and **S3** to reduce false **Sev-2** alerts by decoupling canary tests from upstream data
- Accelerated bug bash validation by **20%** by integrating a **GenAI**-driven agentic workflow to automate ingestion of schema-validated mock data into existing indexing pipelines to streamline testing and reduce operation delays

Fidelity Investments — June 2024 – August 2024

Software Engineer Intern — *Durham, NC*

- Developed Backend services in **GraphQL** via **Experience API** for **Account Opening** which impacts **50+ million users**, and Frontend services in **Angular and TypeScript** for Crypto IRA
- Implemented customer info, address validation, and risk analysis services to prevent user fraud or illegal activity during account opening using **TypeScript and GraphQL** by matching data from multiple downstream APIs

Projects

Synapse: Distributed AI Scheduler | *Go, gRPC, Protocol Buffers, Linux Kernel*

- Engineered a fault-tolerant **Go** scheduler implementing **Gang Scheduling** to enforce atomic resource allocation across dynamic worker nodes, eliminating deadlocks common in **distributed multi-GPU training** workloads
- Developed a bi-directional **gRPC** control plane to orchestrate a custom **Rust** container runtime (**Carapace**), bridging high-level scheduling with low-level **Linux syscall** execution via the **Fork/Exec** model

Carapace: Linux Container Runtime | *Rust, C++, Linux Syscalls, Cgroups, Namespaces, Bash*

- Architected a container runtime in **Rust** that interfaces directly with the **Linux Kernel** via **syscalls**, leveraging **Namespaces** (UTS, PID, Mount) and **chroot jails** to achieve strict process isolation
- Enforced resource quotas via **Control Groups (Cgroups v2)** to prevent process exhaustion attacks (e.g., fork bombs), and developed a **C++ FFI** interoperability layer to bridge Rust with low-level system inspection tools

CQLite: Embedded Database Engine | *C, Ruby, RSpec, Bash*

- Built a persistent **B-Tree** database engine in **C** by modeling **SQLite's** internal structure, supporting **O(log n)** key lookup, in-order traversal across leaf pages, and dynamic splitting of internal and leaf nodes
- Implemented page-level memory management and cursor-based traversal, enabling range queries, recursive visualization, and structural correctness across **50+** randomized inserts

Technical Skills

Languages: C/C++, Go, Python, Rust, Java, Kotlin, TypeScript, JavaScript, HTML/CSS, Assembly, Swift/SwiftUI
Frameworks/Libraries: React.js, GraphQL, Angular, Node.js, PostgreSQL, NumPy, Pandas, Matplotlib, JUnit
Developer Tools: AWS, GCP, Kubernetes, Git, GitHub, Vim, Jira, Jenkins, Linux Kernel, XCode