

William Nayar

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CS student specializing in backend engineering, system design, and building scalable distributed systems

Education

National University of Singapore

Aug 2023 – May 2027

Bachelor of Computing in Computer Science, Specializing in Software Engineering

Honours (Distinction)

Relevant Coursework: Data Structures & Algorithms, Design & Analysis of Algorithms, Operating Systems, Computer Networks, Database Systems, AI & Machine Learning, Software Engineering Principles & Patterns

Awards & Certificates

NUS – Certificate of Distinction, Software Engineering: 4.50 GPA across key Software Engineering modules

AI Builders Hackathon – Awarded 1st Place in Daytona HackSprint: Built [Airlock](#), a safety gate for AI agents

HackerRank – Software Engineering Certification: Problem Solving, SQL

NUS – Orbital Apollo 11 Certification: Advanced independent software development project

Technical Skills

Languages: JavaScript, TypeScript, Python, Java, SQL, HTML, CSS, C, C++, Bash, MQL4, MQL5, PAT

Frameworks & Libraries: React, Node.js, Express, Flask, Tailwind CSS, REST APIs, Mongoose, Supertest, JWT

Databases: MongoDB, PostgreSQL, Supabase, Redis, SQLite, Firebase

Tools: Git, Docker, Postman, Jest, Google Cloud, Cloudflare, GitHub Actions, CI/CD, Linux, Nginx, AWS, Claude

Experience

National University of Singapore – Teaching Assistant

Aug 2026 – Present

- Teaching Assistant for CS3219 (Software Design and Architecture). Teaching weekly classes of 20 students
- Mentor student teams in designing and building a production-oriented distributed application using microservices, REST APIs, containerisation, CI/CD, and cloud deployment, with an emphasis on scalability, maintainability, and architectural trade-offs.

Mongoose and Node-Redis – Open-Source Contributor

July 2026

- Contributed 3 merged pull requests to Mongoose (27K+ stars) and node-redis (17K+ stars), approved by the projects' lead maintainers, documenting the missing perDocumentLimit populate option and its per-document semantics ([PR#16371](#), [PR#16369](#))
- Traced event emission through node-redis's socket source to correct README docs referencing the deprecated disconnect() API ([PR#3332](#))

Projects

Backend & Distributed Systems Developer, TypeScript | Fastify | SQL | Redis | Docker | Kubernetes Jul 2026 – Present

[DeepCS](#) – Solve CS interview questions solo or live with a matched partner

- Built a distributed 6-service backend in TypeScript and Fastify, with path-filtered CI building and health-checking each service's image independently
- Built real-time collaborative editing on WebSockets and Yjs (CRDT), syncing edits across instances via Redis pub/sub, 250 sockets at p95 4 ms on one machine
- Built a custom API gateway with Firebase JWT verification against Google's JWKS, and made rate limiting and partner matching atomic with Redis Lua scripts
- Designed the data layer as one PostgreSQL instance with a schema and role per service, with an integration test asserting the database rejects cross-service queries
- Built an event pipeline on Redis Streams with a consumer that acks after commit, making at-least-once delivery effectively exactly-once
- In progress: running the stack on Kubernetes locally. Future: a GKE/GCP sprint, a Kafka adapter behind the event-log interface, and Drizzle over the pg layer

Founder & Developer, React | TypeScript | PostgreSQL | Vercel | Cloudflare

Jan 2026 – Present

[Aqua Vitae Parfums](#) - Perfumes that I make and sell myself

- Designed a scalable frontend architecture using re-usable layouts, modals, and state management techniques, enabling ~70% code sharing and efficient creation of new features
- Implemented centralized cart state management using React Context and localStorage that allows real-time cart data sharing between different parts of the frontend (Navbar, product page, cart, overlays, etc.)
- Configured CI/CD and production deployment through Vercel, Cloudflare DNS, and GitHub automation