Charles Chow

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SUMMARY

Software engineer focused on backend systems, distributed coordination, real-time data pipelines, and performance optimization. Built high-throughput APIs, Redis-backed services, PostgreSQL optimizations, and cloud-native microservices across multi-service architectures.

SKILLS

Languages	Go, Python, Java, C++, TypeScript, JavaScript, SQL, C
Backend	Node.js, Django, REST APIs, gRPC, WebSockets, Apache Kafka
Databases	PostgreSQL, MySQL, Redis, DynamoDB, MongoDB
Cloud / Infra	AWS (EC2, Lambda, S3, CloudWatch), Docker, Kubernetes, Linux, Git, GitHub Actions
Systems	Distributed systems, microservices, CI/CD, observability, performance tuning, real-time data pipelines

RELEVANT EXPERIENCE

Software Engineer Intern, NeuroLeap 05/2025 – 12/2025

- Built high-availability Node.js REST APIs with Redis caching, session coordination, and request deduplication across horizontally scaled service instances, sustaining 900 req/sec with sub-180ms p95 latency.
- Reduced PostgreSQL p95 latency from 420ms to 110ms on 8M+ rows by improving indexes, query plans, connection pooling, and ingestion workflows; increased ingestion throughput 2.8x.
- Improved API reliability with idempotency keys, structured error handling, and request tracing to make failures easier to debug across service boundaries.
- Reduced React dashboard UI latency from 280ms to 65ms via virtualization and off-thread parsing; added CloudWatch instrumentation for end-to-end observability.

Software Engineer Intern, Infinite Option 05/2024 – 08/2024

- Reduced recurring production incidents by 32% and lowered MTTR from 45 to 18 minutes by standardizing Joi validation middleware across API endpoints.
- Implemented multi-tier RBAC, JWT authentication, refresh token rotation, and Redis-backed session invalidation to improve API authorization and session security.
- Refactored authentication and authorization middleware into reusable modules, reducing duplicate logic across protected API routes.

SELECT PROJECTS

Distributed Rate Limiter — Go, Redis, gRPC, Docker

- Built a distributed rate limiting service in Go with Redis Lua scripts for atomic token-bucket decisions across horizontally scaled service instances.
- Sustained 12K req/sec under 40 concurrent clients through a containerized gRPC service backed by Redis.
- Added sliding-window limiting, TTL cleanup, and concurrency validation with 52 tests and high-volume simulated traffic.

ShopCloud — Python, Go, TypeScript, AWS, DynamoDB, EventBridge, CDK

- Built a cloud-native e-commerce platform with 7 independently deployable services across Python Lambda, Go ECS Fargate, Node.js BFF, DynamoDB, EventBridge, SQS, and CloudFront.
- Implemented Saga orchestration with compensation rollback across Inventory, Payment, and Shipping services, maintaining consistency across 12 DynamoDB tables.
- Built atomic inventory reservations with DynamoDB TransactWriteItems, dual idempotency protection, and a circuit breaker; validated with 70 tests using pytest and moto.

Interactive SQL Learning Platform — Django, React, PostgreSQL, OpenAI API

- Built full-stack SQL practice workflows with React, Django REST APIs, PostgreSQL-backed user progress tracking, and submission history.
- Integrated LLM-generated SQL hints using structured JSON outputs, validation checks, retries, and fallback handling to improve response consistency.
- Designed relational schemas for users, submissions, progress, and exercise modules with concurrent session handling.

EDUCATION

Purdue University | M.S. Electrical and Computer Engineering — In Progress

Northeastern University | M.S. Computer Science — May 2026

The Ohio State University | B.S. Mechanical Engineering — Dec 2020