Shams Rupak

New York, NY — 646-619-7873 — shamsrupak@gmail.com

linkedin.com/in/shams-rupak-262906272 — github.com/ShamsRupak — shamsrupak.lovable.app

Summary

Software Engineer with strong foundations in data structures, algorithms, and systems programming. Experienced building production-style backend services in C++ and Python with concurrency, caching, databases, testing, and CI. Proven ability to design, debug, and optimize systems with clear performance and reliability constraints.

Technical Skills

Languages: C++, Python, Java, SQL, JavaScript, C
Core CS: Data Structures & Algorithms, Object-Oriented Design, concurrency, memory management (RAII), complexity analysis
Backend Systems: REST APIs, authentication (JWT), caching, rate limiting, pagination, async I/O
Databases: PostgreSQL, schema design, indexing, migrations (Alembic), transactions
Testing & Quality: unit/integration testing, CI (GitHub Actions), sanitizers (ASAN/UBSAN), debugging
Tools: Git, Linux, Docker, Redis, FastAPI, CMake

Education

Stony Brook University, New York, NY

M.S. Engineering Artificial Intelligence (Expected Dec 2026)	Aug 2025 – Dec 2026
B.S. Applied Mathematics and Statistics	Aug 2021 – May 2025

Relevant Coursework: Data Structures and Algorithms, Object-Oriented Programming (C++), Software Engineering

Experience

Stony Brook University — Teaching Assistant, Object-Oriented Programming (C++)   Jan 2026 – Present

- Mentored 30+ students in C++ systems programming, covering OOP design, STL containers, dynamic memory, RAII, and pointer safety.

- Debugged segmentation faults, memory leaks, and logic errors; conducted code reviews emphasizing correctness, modularity, and performance.

AI Engineering and Automation Extern   May 2025 – Jul 2025

- Designed and implemented a Python-based document processing pipeline ingesting 1,000+ financial documents with OCR, validation, and classification stages.

- Increased throughput by 60% by optimizing I/O, reducing redundant computation, and refactoring monolithic logic into reusable, testable components.

Projects

CacheCraft — Concurrent In-Memory Cache Server (C++20)   2026
github.com/ShamsRupak/cachecraft

- • Built a Redis-inspired TCP cache server with O(1) LRU eviction, TTL expiration, and sharded thread-safe storage.

- Implemented benchmarking and profiling to measure throughput and p50/p95/p99 latency; validated correctness with unit and integration tests.

- Set up cross-platform CI (Linux/macOS) with sanitizer builds (ASAN/UBSAN) and resolved platform-specific toolchain issues to keep CI green.

PulseAPI — Production Backend Service (FastAPI)   2026
github.com/ShamsRupak/pulseapi

- Developed a REST API with JWT authentication, RBAC, PostgreSQL data modeling and migrations, Redis caching and rate limiting, and health/metrics endpoints.

- Containerized services with Docker Compose and enforced code quality through automated testing and CI pipelines.

AI Document Processing Suite (Python)   2025
github.com/ShamsRupak/ai-doc-processing-suite

- Built end-to-end ingestion for scanned PDFs using OCR and structured extraction, with evaluation utilities and semantic retrieval for document querying.