# ALEX LI

Bellevue, Washington | alexxuanqili@gmail.com | (703) 981-4596 | linkedin.com/in/alex-li12 | AlexXLi12.github.io

## TECHNICAL SKILLS

- **Programming Languages:** Python, C/C++, SQL, Java, JavaScript, SystemVerilog, HTML/CSS
- **Frameworks/Libraries:** Flask, Spring Boot, Express, React, Next, PyTorch, NumPy, pandas
- **Tools & Platforms:** Linux, Git, Make, PostgreSQL, Terraform, Docker, FPGAs, ModelSim, AWS, gprof, gRPC

## EDUCATION

**University of Washington**, Seattle, WA — Expected June 2027
B.S., Computer Science — GPA: 3.7

**Relevant Coursework:** Discrete Mathematics, Linear Algebra, Data Structures and Parallelism, Hardware/Software Interface, Systems Programming, Digital Circuit Design, Machine Learning, Distributed Systems, Data Management, Datacenter Systems, Computer Architecture

**Awards: Best Use of AI + Best Finance/Data Analytics Project** (HackTech 2025), **1st Place** DubHacks 2023 (Synergy Track), **Futureforce Selectee** (Salesforce Data Cloud), Dean's List (2023–25)

## RELEVANT EXPERIENCE

**Chewy, Inc.** | *Spring Boot, Terraform, AWS, Mockito, Guice* — June 2025 – August 2025
*Software Engineering Intern*

- **Owned the architecture and deployment** of a report scheduler to replace Kevel (3rd party) for Chewy Ads to enable in-house scheduling, authorization, and report delivery via S3 using AWS Lambda, SQS, and DynamoDB.
- Led design reviews with senior engineers, incorporating **fault-tolerant patterns** such as exponential backoff, DLQs, and deduplication through SHA-256 hashing.
- Owned back-end infrastructure and API development to support **scalable, idempotent reporting workflows** with consistency guarantees across retries and failures.

**UW Sensor Systems Lab** | *FPGAs, Verilog, GTKWave, Python, Serial Interfaces* — December 2024 – Present
*Undergraduate Research Assistant*

- Built low-level drivers for FPGA-controlled acoustic levitation arrays; Optimized the UART protocol from scratch to replace $I^2C$ and boost throughput on the **primary signal pipeline**.
- Programmed transducer synchronization code to serialize phase-angle control across **100+ actuators** in real-time object manipulation experiments.

## PROJECTS

**Othello Game Engine** | *C++23, Multithreading, Profiling, gRPC, Docker* — GitHub

- Built a parallel iterative–deepening $\alpha$–$\beta$ engine with principal variation search (PVS) and a cache-friendly transposition table (TT) using Zobrist hashing; avg throughput: **18.50M nodes/s @ d10** (149.8 ms/pos), **8.93M @ d13** (7.87 s/pos).
- Optimized search with PVS and **bitboard-native move ordering** (corners → edges, TT seeding), cutting per-position latency by **90%**.
- Profiled and accelerated the search hot path by **sharding the TT per thread** (2× deep-ply throughput) and **rewriting move gen to eliminate STL overhead**; improved d13 latency **8.7s → 7.8s**.
- Exposed engine over **gRPC** (protobuf APIs) to support real-time remote play and future game-room orchestration.
- Containerized the engine with **Docker** for consistent benchmarking, local development, and future deployment in a microservice architecture.

**Distributed Key-Value Store (Multi-Paxos, Sharded)** | *Java, Multi-Paxos, Sharding*

- Implemented a fault-tolerant, linearizable **sharded key-value store** using Multi-Paxos for log consensus and dynamic shard rebalancing.
- Wrote node logic for **leader election**, shard replication, and consensus-driven reconfiguration. Verified correctness with an adversarial distributed test suite.
- Authored a detailed specification covering architecture, consensus, and failure semantics under partitioned networks and crash faults.

**Renaissance Research** | *LLMs, Pydantic, BeautifulSoup, Next.js* — Live Demo

- Designed an AI-driven research assistant to scrape, summarize, and evaluate **200+** academic papers for contemporary relevance.
- Built a structured prompting system using Pydantic schemas and LLM self-reflection to enforce consistent, structured output.
- Won **Best Use of AI** and **Best Finance/Data Analytics Project** at HackTech 2025 (Caltech).