Justin Hernandez Tovalin

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EDUCATION

University of Washington - Seattle June 2027
Bachelor of Computer Science

Relevant Coursework: Operating Systems, Computer Networks, *Data Structure & Algorithms (A-), Database Systems (A),*

SKILLS

Programming Languages: C++, C, Python, Java, JavaScript, TypeScript

Web Development: HTML/CSS, React.js, Node.js

Tools & Technologies: Git, Linux/Unix

Database: MySQL, PostgreSQL

Academic Projects

Web Server Seattle, WA
CSE 333 Project April 2025 - June 2025
- Architected and implemented a multi-threaded HTTP/1.1 web server in C++ from scratch, utilizing a thread pool to manage concurrent client connections over IPv4/IPv6.
- Developed a full-text search engine in C, building a file-based inverted index from 10,000+ documents and implementing a multi-index query processor with ranked results.

OutFit Picker Seattle, WA
CSE 340 Project April 2025 - June 2025
- Led 4-person Flutter development team as primary engineer, contributing 3,000 of 5,000 lines of code while conducting all PR reviews and final merge approvals.
- Established Git workflow standards and wrote onboarding documentation, eliminating merge conflicts throughout development.

PROJECTS

Project Adam October 2025 - Present
- Engineered work-stealing thread pool achieving ~20x task dispatch improvement through per-thread deques and cache-aware design
- Engineered lock-free concurrent data structures using C++17 atomics, compare-and-swap operations
- Developed 15+ core data structures with manual memory management including Red-Black Tree (self-balancing BST), LRU Cache, and network primitives (Bloom Filter, Ring Buffer)

SupplementIQ September 2025 - Present
- Architected a role-based access control (RBAC) system using Supabase RLS and JWT, achieving sub-50ms permission checks on Vercel via TypeScript caching.
- Engineered a high-throughput moderation workflow to process 500+ daily submissions, featuring real-time status updates and automated migration of approved content.