Rohan Bafna

Software Engineer

rbafna.com
github.com/rbafna6507
rbafna@umich.edu
864-908-2002

Education

University of Michigan, Ann Arbor

May 2026

• B.S.E in Computer Engineering • Data Structures & Algorithms • Distributed Systems • Operating Systems • Computer Architecture

Experience

Microsoft, Software Engineer Intern

May - Aug 2025

- Optimized a core Microsoft Teams API from 7 seconds to 50 milliseconds at 330K requests/minute for 3 million monthly users by pruning database connections, reducing I/O, implementing multithreading, async network calls, + introducing caching in C++.
- Implemented new Microsoft Teams APIs + functions for Houston, a site-reliability tool, empowering SREs to troubleshoot client issues before they reach engineering teams, saving 100s of hours of client downtime & ~4% fewer engineering tickets.

Chewy, Software Engineer Intern

May - Aug 2024

- Deployed an API and UI using Java Springboot and Next.js for a new fulfillment center (FC) labor management platform that allocates employees to understaffed warehouse labor functions in real time, improving FC throughput of orders by 7%.
- Developed backend in Java for Slotbot, an FC service that automates rule-based item placement within warehouses to streamline the packaging process, eliminating 50% of human input in slotting decisions + increasing FC productivity by ~5%.

Bold Metrics, Software Engineer Intern

May - Aug 2023

- Engineered an automated integration testing system using Python, BS4, Selenium, and AWS Lambdas to validate product visibility and check if Smart Size Chart returned correct recommendations for 10,000 products across 12 clients.
- Designed new size charts using past body measurements while sorting garments into unique categories based on sizing, doubling the number of supported clothing types and garments to deliver 2.5x more recommendations for our 3 largest clients.
- Created a CLI with Python that enabled every client to upload 100s of new garment size charts every month to PostgreSQL database to automate model training, increasing training frequency by 10% and model accuracy by 6%.

Projects

Kernel Level Thread Library (C++)

2025

- Implemented a kernel-level C++ thread library on Unix from scratch, handling CPU booting, thread lifecycle management, multi (50+) CPU management, timer and inter-processor interrupts, atomicity, and FIFO thread scheduling order.
- Added support for low level synchronization primitives like mutexes and condition variables that leverage an atomic guard variable to implement spinlocks for mutual exclusion in multi-core environments.

RISC-V Processor Prototype, Linker, & Assembler (Verilog & C++)

2024

- Prototyped an efficient “out of order” superscalar processor (R10K) in Verilog, equipped with register renaming, data forwarding, and hazard handling. Included a data and memory cache simulator to achieve cycles per instruction under 1. Implemented instruction prefetching, branch prediction (GShare), and early branch resolution.
- Built a C++ simulator for a compiler, assembler, and linker that translates RISC-V Assembly code into binary, resolves multi-file dependencies, & simulates running the executable on hardware silicon. Built a visual debugger to step through register states.

Flight Routes Path Optimizer (Python)

2023

- Implemented a flight routing optimization experiment in Python using the A* path finding algorithm on historical flight, airport, and connection data from the OpenFlights dataset, containing 67,663 unique routes, 3,321 airports, and 548 airlines.
- Created a real-time map-based visualizer and Next.js frontend to inspect flight route optimization based on distance traveled, fuel consumption, time taken, and overall environmental impact.

Quadcopter Drone from Scratch (C++)

2022

- Designed, wired, programmed, and built a quadcopter using Arduinos and Raspberry Pis in C++
- Built a remote controller and transmitter/reciever logic using NRF24L01 modules and custom flight controller with PID system utilizing the onboard gyroscope and accelerometer to stabilize the drone during flight.

Tools • C/C++, Rust, Python, Java, JavaScript, Flask, ROS, Next.js, Node.js, React, TensorFlow, Pytorch, MongoDB, SQL, AWS