Rayhan Mohamed

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Education

Rutgers University — New Brunswick, NJ
Bachelor of Science in Computer Science and Statistics (Double Major) — *Expected May 2028*

Experience

Coding Task Author & Evaluator (Contract) — Jun. 2025 – Present
DataAnnotation — *Remote*

- Wrote and reviewed coding tasks in **Python**, **C++**, and **Rust** used to train and evaluate AI coding models, including reference solutions, edge cases, and automated tests.
- Graded 1,000+ submissions for correctness, memory safety, and time/space complexity, and rewrote tasks whose specifications produced ambiguous results.
- Wrote reference solutions covering concurrency, asynchronous event loops, and relational schema design.

Software Engineering Intern — Sep. 2024 – Jun. 2025
CTFGuide — *Remote*

- Built and maintained **REST APIs** and **WebSocket** connections for real-time scoring in multi-tenant CTF challenge sandboxes, fixing race conditions and state desync between concurrent users.
- Trimmed WebSocket message payloads to cut client-server latency during concurrent scoring events.
- Containerized challenge sandboxes with **Docker** — process isolation, memory limits, deterministic teardown — driven from GitHub Actions CI/CD.
- Refactored front-end modules to **TypeScript** with clearer component state handling, speeding up builds and tests.

Projects

PulseMap | *Rust, wgpu, ONNX* — 2026

- Built a **Rust** desktop app that embeds a folder of drum samples with a local CLAP model and lays them out on a 2D map you can browse by ear, rendered with **wgpu**.
- Runs the encoder on-device through ONNX Runtime, so the app works fully offline with no server dependency.
- Decodes and analyzes audio on background threads, keeping the UI responsive during large batch imports.

Wikipedia Graph Visualizer | *TypeScript, WebGL, Deck.gl, SQLite* — 2026

- Runs SQLite in the browser over HTTP range requests against a 25GB database, so querying the full Wikipedia link graph needs no backend.
- Compiled the raw Wikimedia XML dumps into an adjacency-list index of 6.9M articles and 100M links.
- Renders millions of nodes with **Deck.gl** and custom **WebGL** at 60fps, with client-side BFS/Dijkstra pathfinding between any two articles.

FlipFocus | *Swift, SwiftUI, CoreMotion, StoreKit* — 2026

- Shipped a SwiftUI iOS app to the App Store: flip the phone face down to start a focus session, tracked through **CoreMotion**.
- Processes accelerometer changes on background queues to keep battery use low.
- Stores sessions, streaks, and themes locally with **SwiftData**.

Hackathons & Awards

Forget Me Not | *React, TypeScript, FastAPI, Gemini, OpenCV* — Winner — HackRU F'25

- Built the patient-facing React/TypeScript client for an AI memory platform for dementia patients, playing back narrated memories generated by a FastAPI pipeline (Gemini, OpenCV, ElevenLabs).

FairFlow | *React, FastAPI, SQLite, Grok, X API* — Winner — HackPrinceton F'25

- Built a community-lending app where Grok turns linked spending data into plain-English risk scores, with matched loans auto-posting to a shared X account through the X API.

Technical Skills

Languages: Rust, C++, C, Python, TypeScript, JavaScript, Swift, Java, SQL (PostgreSQL, SQLite), HTML/CSS
Systems & Infrastructure: Docker, Linux/POSIX, WebSockets, RESTful APIs, Git, CI/CD (GitHub Actions), Nginx
Frameworks & Libraries: FastAPI, React, Next.js, Node.js, SwiftUI, Tailwind CSS, Vite, wgpu, WebGL, Deck.gl
Databases & Data Systems: PostgreSQL, PostGIS, SQLite, MongoDB, Redis, Vector Databases, ONNX