JUAN A. MARULANDA

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EDUCATION

Carleton University — Ottawa, ON
Bachelor of Computer Science, AI and Machine Learning Concentration — *2023 – 2027*

EXPERIENCE

Bedarra Corporation — Ottawa, ON

Mobile Software Developer Intern — *May 2025 – Sep 2025*
- Enabled mobile deployment by compiling Rust backend to AOT binaries with FFI bindings for Flutter application.
- Integrated on-device REST API, P2P **synchronization engine**, and full-text search to run natively on mobile platforms.
- Extended cross-platform application to support 5 platforms (iOS, Android, Web, macOS, Windows) while debugging resource constraints and platform-specific edge cases.

Part-Time Full-Stack Software Developer Intern — *Sep 2024 – Apr 2025*
- Collaborated directly with **Dave Thomas** (Creator of Java VMs and Eclipse IDEs) to architect the core P2P engine, applying industrial Smalltalk patterns to modern Rust infrastructure.
- Refactored Rust-to-FFI bridge to support asynchronous callbacks, enabling non-blocking communication between Flutter UI and Rust backend.
- Designed primary-node synchronization architecture using QUIC-based P2P protocols for offline-first data consistency.

Full-Stack Software Developer Intern — *May 2024 – Aug 2024*
- Engineered and deployed scalable email ingestion pipeline using WASI-based IMAP libraries to process thousands of emails.
- Implemented Sonic **search engine** integration for local full-text search, enabling sub-second query responses across email archives.
- Synthesized Doug Engelbart's research on Hypermail with bleeding-edge web3 protocols (from Fission Labs) to design a system that applies the vision of Augment.

PROJECTS

Pet Prompt (Chrome Extension) | *TypeScript, React, Python, Vite, Llama 3.2*
- Built a Chrome extension that turns any AI textbox into an on-device prompt engineer, expanding short user intents into structured prompts using learned templates and page context.
- Implemented persona-based cats that encapsulate reusable prompt patterns for coding, writing, and research, cutting average prompt editing time.
- Designed UI that exposes the 'raw prompt' for power users while keeping casual users in a playful, low-friction flow.

Juan Compiler (Transpiler) | *Java, Smalltalk*
- Designed and implemented custom programming language with tree-walking interpreter to understand how code executes from source to machine-level behaviour.
- Built a full pipeline including scanning, parsing, and an abstract syntax tree to model variables, functions, and control flow.
- Implemented a custom transducer to convert regular expression into finite state machines, deepening my understanding of how languages, and compilers work internally.

TECHNICAL SKILLS

Languages: Rust, Dart, TypeScript, Java, Python, C/C++, SQL (PostgreSQL), JavaScript, HTML/CSS
Frameworks: Flutter, React, Node.js, Tokio, Flask, FastAPI
Developer Tools: Git, Docker, PostgreSQL, SQLite, Linux (WSL), Xcode, Android Studio
Technologies: FFI, WASM, P2P Protocols (QUIC), REST APIs, IMAP

EXTRACURRICULAR ACTIVITIES

uOttaHack (Student-Led Hackathon)
Community Coordinator
- Organized technical workshops and networking events for a hackathon hosting 900+ students from across Canada.

Synchronize (Ottawa's Socratica Node)
Host and Organizer
- Organize and host weekly co-working sessions for a community of makers, engineers, and entrepreneurs in Ottawa.