Lakshman Ramanathan

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EDUCATION

University of Waterloo — Waterloo, ON
Bachelor of Applied Science (BASc) in Computer Engineering — Expected Sep 2030

TECHNICAL SKILLS

Languages: C++, Python, Java, JavaScript/TypeScript
Frameworks & Libraries: React, Next.js, Node.js, FastAPI, Flask, Pandas, Spring Boot
Databases & Cloud: PostgreSQL, MongoDB, SQLite3, Firebase
Developer Tools & DevOps: Git, GitHub Actions (CI/CD), Docker, Linux, REST APIs

EXPERIENCE

Autonomy Engineer – Perception & Navigation Team — Oct 2026 – Present
WATonomous — Waterloo, ON

- Contributed to the autonomous navigation stack in **C++** and **ROS 2**, setting up 2D costmaps, an **A* planner**, and **Pure Pursuit** path tracking tested in **Dockerized Gazebo** simulations while debugging control latency in **Foxglove Studio**.

Software Engineering Intern — Jun 2026 – Sep 2026
Ally Solutions — Arvada, CO

- Reduced manual coordination by **over 80%** for **2** clinics by building **Python** dialing agents and rule-based dispatch logic that automate data gathering from insurance providers for patient coverage verification.
- Achieved **90%+** eligibility accuracy on test data by building a **Python** rule engine, integrating external **REST APIs**, and using local **LLM** inference to predict procedure coverage from prior patient visits.
- Developed **REST APIs** and relational **PostgreSQL** schemas to standardize eligibility records across **3** internal services.
- Gave clients control over call workflows and dispatch timing by building customizable dashboards and **CSV**/**Excel** report exports with **TypeScript, Next.js, React**, **REST APIs** and **LLM Integration**

Backend Developer — Jun 2025 – Sep 2025
ServiceDeck — Toronto, ON

- Reduced manual data processing time by **90%** (from **4 hours**) in an **Agile** team by architecting a **Python** pipeline using **Pandas** and **LLM** extraction to clean, validate, and reformat **20k+** customer **Excel** line records.
- Automated lead generation with a conversational agent that scraped client data, handled WhatsApp/SMS via **Twilio**, and booked appointments; deployed on **Firebase Cloud Functions** and tested on **100** trial interactions.
- Automated service-request intake with a **Python** email classifier extension for service providers using **LLM** prompt engineering and persisting structured events via **Flask** backend **APIs** to **Supabase**.

PROJECTS

Inline System Wide Auto-Correct | C++20, Qt6, llama.cpp, SymSpell, GitHub Actions (CI/CD) — macOS App

- Shipped a macOS desktop app to **35+ users** (correcting **12K+ words**), maintaining release reliability through an automated **GitHub Actions CI/CD** pipeline running **19 unit tests**.
- Engineered a low-latency **C++** correction engine using **OS hooks** (CGEventTap, WH_KEYBOARD_LL), pairing **SymSpell** lookup with a **243K-bigram** language model and keyboard proximity scoring.
- Built offline ghost-text completion by embedding **SmolLM2-135M** via **llama.cpp**, predicting next-token suggestions rendered at the cursor with ∼**15 ms** latency using under **120 MB** RAM and ∼**0.1%** idle CPU.

Double-Entry Ledger Service | Java 21, Spring Boot, PostgreSQL, Docker, GitHub Actions (CI/CD) — Backend API

- Built a double-entry banking **REST API** in **Java 21** and **Spring Boot** backed by **PostgreSQL**, verifying transactional accuracy through **24 JUnit** and **Docker** integration tests in **GitHub Actions CI/CD**.
- Eliminated lost updates and deadlocks under concurrent load by locking **PostgreSQL** account rows in ascending ID order, maintaining exact zero-sum balances across **60 transfers** on **16 threads**.
- Prevented duplicate transfers on network retries by enforcing unique **Idempotency-Key** header constraints.