Prem Patel

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EDUCATION

University of Waterloo — Waterloo, ON
BCS (Computer Science) | GPA: 3.8 — *Expected Dec. 2026*

Wilfrid Laurier University — Waterloo, ON
BBA (Finance Concentration) | President's Gold Scholarship — *Expected Dec. 2026*

EXPERIENCE

Software Engineer Intern — Jan. 2025 – Apr. 2026
Kinaxis — *Ottawa, ON*

- Built end-to-end features in a **distributed C++ server** and **TypeScript (Node.js)** + **Java** agent/worker runtimes over persistent **WebSockets**, improving reliability, latency, and throughput under load
- Shipped a **VS Code extension** to author, publish, and run/debug user-defined **embedded algorithms** with breakpoints, reducing developer iteration time by **40%**
- Launched **Bring-Your-Own-Model** by building a **solver-agnostic** integration layer and **asynchronous job pipeline** to execute user-defined optimization models at scale
- Designed thread-safe CPU/memory **guardrails** in **C++** using **RAII semaphores** to prevent noisy-neighbor resource spikes in **multi-tenant** clusters; cut lock contention by **32%**
- Standardized **structured logging** + metrics integrated with Datadog dashboards to attribute CPU usage per customer, enabling transparent **consumption-based pricing** generating **$1M+** annual revenue
- Improved response serialization with **FlatBuffers** to support **25%** larger payloads and eliminated silent **Node.js** crashes, increasing throughput and reliability under load
- Deployed agent services on **Kubernetes** via **Docker** + **Helm** (**Azure/GCP**) for repeatable rollouts and presented **15** cross-team demos in a fast-paced **Kanban** environment

Software Engineer Intern — Jan. 2024 – May 2024
AutoTrader — *Toronto, ON*

- Developed **Python** services processing OEM feeds for **30+ automotive brands**; reduced end-to-end processing time by **8x** by restructuring transformations and batching (Pandas + REST API integrations)
- Built **Azure Pipelines** automation to generate and deliver monthly reports for **150+ dealerships**, integrating **Redash** queries and enforcing consistent schemas/validation
- Automated PDF/table ingestion and validation with **Tabula**, reducing manual cleanup by **5 hrs** per refresh cycle and improving reporting accuracy by up to **85%**
- Partnered with dealerships to scope purchase-experience requirements and ship feed + reporting updates

Data Engineer Intern — Jan. 2023 – Apr. 2023
D2L — *Waterloo, ON*

- Led a CRM single-source-of-truth initiative by designing repeatable **data-quality** workflows (dedupe, normalize, categorize) across **15k+** records; improved lead routing and expanded target prospect universe by **38%**

PROJECTS

🔗 **Ledger-First Transaction System** | *Node.js, TypeScript, Fastify, PostgreSQL, Prisma* — Jan. 2026

- Designed an immutable double-entry ledger (derived balances) with async trade execution; ensured auditability and replay-safe retries via transactional idempotency keys and **SYSTEM** counterparties enforcing financial invariants

🔗 **Predicting Plant Traits Using CNNs and Boosting** — Jul. 2024 – Aug. 2024

- Designed and implemented a **PyTorch** plant trait prediction pipeline using **ResNet50 CNN** and **XGBoost**
- Applied **Bayesian optimization** to fine-tune models, ultimately improving baseline model performance by **192%**

TECHNICAL SKILLS

Languages: C++, TypeScript (JavaScript), Python, Java, Go, SQL, Bash, C, C#, Kotlin
Dev Tools: Git, VS/VS Code, Node.js, Docker, Kubernetes, Helm, Postgres, Jenkins, Datadog, GCP, Azure, AWS
Frameworks/Libs: React, Flask, Fastify, Prisma, Spring Boot (DI, Filters, MDC, WebSockets), Boost, FlatBuffers