

# Prem Patel

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## EDUCATION

### University of Waterloo

BCS (Computer Science) | BBA (Wilfrid Laurier University)

- GPA: 3.8 | President's Gold Scholarship (merit-based)

Waterloo, ON

Expected Dec. 2026

## EXPERIENCE

### Software Engineer Intern

Jan. 2025 – Apr. 2026

*Kinaxis*

*Ottawa, ON*

- Built features across a **distributed C++ execution server** and **TypeScript (Node.js) + Java** agent/worker runtimes over **WebSockets** to execute user-defined **embedded algorithms** and publish results; shipped a **VS Code extension** enabling run/debug workflows
- Designed thread-safe server/optimizer **guardrails** to prevent resource overuse on large runs; improved stability and cut lock contention by **30%** while rolling out a "Bring Your Own Model" optimization feature
- Developed a **C#** benchmarking harness (bursty/steady) with metrics aggregation and latency profiling across an async queue; extended **Jenkins** AFT CI/CD with unit, integration, and E2E coverage
- Deployed agent services on **Kubernetes** via **Docker + Helm (Azure/GCP)**; standardized a JSON logging schema and integrated **Datadog** dashboards to enable consumption-based pricing
- Enabled **multi-agent** configurations for the **Java** runtime container; improved agent-response serialization using **FlatBuffers** and shipped a new **logger** module to support throughput analysis
- Presented **15** cross-team demos showcasing design decisions and outcomes in a fast-paced **Kanban** environment

### Software Engineer Intern

Jan. 2024 – May 2024

*AutoTrader*

*Toronto, ON*

- Developed and optimized **Python microservices** across **30+ automotive brands**, leveraging **Pandas** and a **REST API** to accelerate OEM data processing by **8x** for partners like Toyota and BMW
- Engineered **Azure pipelines** in **Python** to automatically generate and deliver monthly performance reports to **150+ dealerships**, querying data from **Redash** and managing reporting for select dealer groups
- Optimized data processing algorithms with the **Tabula** library, cutting manual work, saving hours each month, and increasing data accuracy by up to **85%**
- Led new hire **training**, mentoring a new full-time employee and interns, and improved team onboarding

### Data Engineer Intern

Jan. 2023 – Apr. 2023

*D2L*

*Waterloo, ON*

- Owned a CRM single-source-of-truth project; designed repeatable data-quality **workflows** (dedupe, normalization, categorization) across **15,000+** records, improved lead routing, and expanded the prospect universe by **30%**

## PROJECTS

### NBA Analytics Dashboard (Full-Stack Web App) 🌐

May 2025 – Jul. 2025

- Used **React**, **Flask (Python)**, and **PostgreSQL** to visualize NBA player and team performance
- Designed and optimized SQL queries, materialized views, and indexes for scalable reads (~2-3x); implemented role-based auth and triggers for secure access and audit logging

### 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%**

### Compiler and Assembler for a C-like Language 🌐

Jun. 2023 – Aug. 2023

- Implemented an end-to-end WLP4 compiler in **C++**: lexer, recursive-descent parser, semantic/type checker, and **MIPS** code generator; wrote an assembler to emit machine code

## TECHNICAL SKILLS

**Languages:** C++, Python, Java, TypeScript (JavaScript), Go, C, C#, SQL, Bash, Kotlin, R, HTML/CSS

**Systems/Infra:** Kubernetes, Docker, Helm, Linux, CI/CD, WebSockets, FlatBuffers

**Dev Tools:** Git, VS/VS Code, Node.js, Yarn, Maven, CMake, Jenkins, Azure, GCP, Datadog, gtest, Jest

**Frameworks & Libraries:** React, Flask, FastAPI, .NET, Spring Boot, Pandas, NumPy, PyTorch, Boost