

# Kanwarpal Brar

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## EDUCATION

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**University of Waterloo** — Bachelor of Computer Science (BCS) (CGPA: 3.83/4.0) 2020 — 2025

**Key Courses:** Data Structures & Algorithms, Operating Systems, Object-Oriented Programming, Concurrency, Databases

## WORK EXPERIENCE

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### Backend Software Engineering Co-op — Carta

Jan 2023 — Present

- Leading the migration and optimization of report generation code using Apache POI, gRPC + Protobuf for communication, and Java concurrency functionality to speed up user experience
- Developing a permissions-based system in Django to prevent unauthorized access to stakeholder financial reports

### Software Developer Co-op — Arctic Wolf Networks

May — Aug 2023

- Reduced response times 25% by designing and developing a concurrent Prometheus metrics monitoring system in Go for an Apache Kafka Wrapper, contributing to a successful release
- Designed a reflection-based Go Test verification algorithm, identifying missing/broken metrics tests with 100% accuracy by cross-referencing tested & untested metrics
- Reduced lead times by designing a forward & backwards compatible Serialization system based on SchemaVer and Avro Schema versions, for a Python Kafka wrapper
- Identified, investigated, and planned fix for a REST API bug across multiple AWS Python/Go microservices caused by improper adherence to OpenAPI 3.0 specification

### Full Stack Software Developer Co-op — Genesys Laboratories

Sept — Dec 2022

- Reduced service costs 10% by transitioning scheduling API to serverless using Python, Flask, and AWS Lambda + SQS
- Developed attractive scheduling UI in a Vue.js frontend, interacting with a Kafka-based event-forwarding system
- Rewrote schedule state management REST API in Python + Flask + RESTX, reducing codebase size by 30%
- Standardized REST API Unit/Integration tests in Python by designing fixtures, decreasing future development time.

### Software Engineering Intern — Cloudspark Labs (Startup)

Jan — Apr 2022

- Led ground-up design/development of RESTful and Event-Driven microservices for web apps leveraging Microsoft Azure
- Leveraged Azure Service Bus to develop decoupled microservices, ensuring scalability with Azure autoscale
- Led the development of Event-Driven Licensing, Notification, and Auth microservices for a start-up MVP launch, utilizing TypeScript, Nest.JS, CosmosDB, and Dependency Injection

### DevOps Co-op — Pillar To Post

May — Aug 2021

- Designed and Developed an Automated Web Software Testing Framework in Selenium using Python and JavaScript, eliminating manual testing and saving 100+ company hours

## PROJECTS

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### UWaterloo Locator — React | Typescript | AWS | Nest.js | Mapbox | Leaflet

- Developed a web app using a CSS + React + JavaScript frontend, mapping through Leaflet & MapBox API
- Architected & deployed a TypeScript & Nest.js backend to AWS, aggregating washroom data from all users
- Applied NoSQL principles in DynamoDB to perform CRUD operations on washroom data in real-time

### Simple-Event-Bus — C++ | Boost.ASIO | TCP Sockets | Concurrency

- A concurrent C++ event bus/event streaming software designed to provide functionality similar to Apache Kafka
- Implemented direct TCP socket communication for low-latency event streaming and minimal overhead
- Utilized Active Object pattern to enhance concurrency and scaling through administrator and worker threads
- Optimized for high throughput by leveraging Boost.ASIO asynchronous I/O operations

## SKILLS

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**Programming:** C++, C#, C, Python, TypeScript, JavaScript, Java, Go, HTML + CSS, SQL, SASS/SCSS

**Knowledge:** Microservices, REST APIs, Object-Oriented Programming, Concurrency, CI/CD, Distributed Systems

**Technologies:** AWS, Azure, Git, Node.js, React, Vue.js, Nest.js, Docker, Kafka, Flask, Linux, NoSQL, Avro