# **Kanwarpal Brar**

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# **Education**

**University of Waterloo** 

Waterloo, Ontario, Canada

Bachelor of Computer Science (BCS) | CGPA: 3.84/4.0

2020 - 2025

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

# Work Experience

#### Carta

#### Payments Software Engineering Co-op

Sept 2024 - Dec 2024

- Averted \$5000+ in potential regulatory penalties within first 2 weeks by implementing financial compliance controls with Django + React
- · Managed \$5M+ monthly leading international banking integration expansion, leveraging Python, gRPC, and Domain Driven Design
- Architected highly scalable Microservices on AWS with Docker and Kubernetes, achieving 99.99% uptime for robust fintech operations
- Slashed network overhead 50% by implementing centralized money movement controls with RBAC in a Java Microservice
- · Accelerated feature development 40% through flexible Django permission system using YAML-templated definitions

### **University of Waterloo**

#### Distributed Systems Research Assistant

May 2024 - Aug 2024

- Benchmarked serverless frameworks with WRK and custom Bash scripts, informing design decisions for high-performance system architecture
- Delivered 200+ requests/second per node by deploying & optimizing Kubernetes clusters with KNative Serving and Istio ingress controls
- · Cut cold-start latency 20% through targeted autoscaling and TCP/IP network optimization, increasing platform responsiveness
- Designed architectural changes improving resource utilization 15%, validated with monitoring scripts in a comprehensive technical report

#### Carta

### Backend Software Engineering Co-op

Jan 2024 - Apr 2024

- Accelerated OCX report generation speed 10% using an O(n) complexity cell management system with Apache POI + Java, streamlining results
- · Enhanced Al-powered search accuracy by 6% via refined prompt engineering for report queries & real-world use-cases
- Eliminated 3000+ tickets by streamlining Ownership Report permissions in Django, collaborating cross-functionally with product leaders
- · Slashed user wait times by 10% through optimizing ownership report queries in Spring, enhancing system responsiveness

#### **Arctic Wolf Networks**

Software Developer Co-op

May 2023 - Aug 2023

- Slashed response times by 25% by implementing a concurrent Go monitoring system for Prometheus metrics on an Apache Kafka wrapper
- Attained 100% accuracy in identifying test gaps with a reflection-based Golang unit test verifier for an Apache Kafka wrapper
- Expedited development by creating a forward/backward compatible Kafka Serialization system using SchemaVer and Avro

#### **Genesys Cloud Services**

### Full Stack Software Developer Co-op

Sept 2022 - Dec 2022

- Slashed hosting costs by 5% by migrating a monolithic scheduling API to an end-to-end serverless architecture with Python + Flask + Lambda
- Compressed codebase size by 30% and enhanced maintainability through a documented Python + Flask + OpenAPI service for scheduling

## **Cloudspark Labs**

Software Engineering Intern

Jan 2022 - Apr 2022

- Crafted scalable RESTful and event-driven microservices for web applications using Microsoft Azure, meeting evolving user demands
- Spearheaded the creation of Licensing, Notification, and Auth microservices with TypeScript, Nest.JS, and CosmosDB, for a startup MVP

# **Projects**

# Event-Driven Data Aggregation App 🦪

2025

- · Architected robust backend with Go + Gin, implementing CQRS and Event Sourcing for real-time data updates
- · Achieved sub-200ms query latency with Goroutines, optimized Event Sourcing architecture, and efficient WebSocket handlers
- Crafted responsive cross-platform experience with React Native + Google Maps SDK, enabling dynamic location-based features

### Concurrent Lock-Free Hash Table 🔘

2025

- Built concurrent hash table in C++ reaching 100M+ ops/sec on 64+ cores with <1µs latency using lock-free techniques and open addressing
- Achieved 10x performance over mutex-based tables with linear scaling across cores using CAS operations and cache-line padding

#### Location-Based Social Discovery App (

2025

- Boosted event attendance by building a geolocation-based app with **Kotlin** and **Firebase**, simplifying user discovery of local gatherings
- Implemented MVVM, Repository, and Singleton design patterns to ensure modular, maintainable architecture for future expansions

# **Skills**

Languages: Python, C++, Java, Go, TypeScript, JavaScript, Kotlin, C#, C, SQL

Frameworks: Spring Boot, Django, Flask, Gin, Node.js, Express.js, React, React Native, GraphQL, REST APIs, OAuth2.0

Data Systems: PostgreSQL, MongoDB, Redis, Elasticsearch, Hadoop, Spark, HBase, Kafka, ZooKeeper, gRPC, Protocol Buffers, Avro

Infrastructure: AWS, Azure, Kubernetes, Docker, Terraform, CI/CD, GitHub Actions, Jenkins, Linux, Git, Microservices, CQRS, Event Sourcing, TCP/IP