AEKUS SINGH TREHAN

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EDUCATION

Honours Bachelor of Computer Science, Carleton University | **3.95 GPA** Apr 2026

- Specialization in Artificial Intelligence and Minor in Mathematics with $16,000 scholarship for attaining above 95% average
- Related Coursework: Operating Systems, Design and Analysis of Algorithms, Database Management, Principles of Computer Networking, C++ Software Engineering, C Systems Programming, Object-Oriented Software Engineering, Data Types and Algorithms, Web Applications, Java Object Oriented Programming, Discrete Math I & II, Calculus I-III, Linear Algebra I & II

SKILLS

Programming Languages: Python, Java, C, C++, SQL, JavaScript, HTML, CSS, HCL
Developer Tools: Spring, Spring Boot, Postman, Maven, Nexus, Linux, Bash, Docker, Git, React, Angular, Agile, Kanban, Jira
Infrastructure Tools: AWS, PostgreSQL, Firebase, SonarCloud, Terraform, Bitbucket, GitHub, Datadog, Jenkins, OpenShift
Certifications: AWS Certified Cloud Practitioner, Postman Student Expert

WORK EXPERIENCE

Software Developer Intern | *TechInsights* May 2024 – Present

- Worked on the Rapid Response team to build new features for TechInsights' **100 thousand users** using Java and JavaScript
- Modernized the legacy **Java backend** for the platform's services to enhance user operations, **cutting runtime by 10%**
- Created an in-memory ElasticSearch instance using **Docker Containerization** for comprehensive unit and integration testing
- Enhanced the functionality and reliability of web and mobile platforms by developing and maintaining **Spring Boot services**, **SDKs**, and **AWS Lambdas** through the implementation of **REST API** endpoints, **SQL** queries, features and bug fixes

Teaching Assistant, Data Structures and Algorithms | *Carleton University* Sept 2023 – Present

- Mentored **250+ students** to evaluate trade-offs in data structures and algorithms by emphasizing Asymptotic Analysis in time and space complexity calculations, resulting in a **5% increase** in class grade performance
- Conducted workshops focused on debugging techniques with data structure and algorithm architectures, providing insights into how to choose between diverse data organization methods as well as **sorting algorithms** and **graph traversals** among others

Software Developer Intern | *Innovapost* May 2023 – Aug 2023

- Leveraged **Java** and **Scala** environments alongside **Spring Boot** integrations for **Json** data processing to assist with the advancement of Producer Adaptors, resulting in an **18% increase** in payload support and optimized data throughput
- Worked on **cloud-based microservices** in a cross-functional scrum team with Deloitte for package tracking and delivery services, leveraging Protocol Buffers with **gRPC API** for fast communication between services
- Utilized **Jenkins** for CI/CD workflows, **OpenShift** for container orchestration and **SonarQube** for code quality analysis

PROJECTS

Touchless – *AWS Lambda, DynamoDB, Flask* Finalist, Phreesia Challenge, Best Accessibility Hack @ UOttaHack

- Empowered healthcare institutions by introducing a web application that ensures safe and accessible information gathering, eliminating the risk of disease transmissions through physical contact with common touch-points, such as screens
- Integrated **AWS Gateway**, **Lambda**, and **DynamoDB** to build a secure API for medical data processing and storage
- Leveraged OpenCV and speech-to-text technology to design a user interface for both visual and verbal communication

SQLidify – *Flask, Google Colab, Cohere AI* Cohere Challenge Winner @ McHacks

- Identified and mitigated SQL query vulnerabilities within code bases using Cohere AI, offering step-by-step solutions users can take for program protection - beat 28 other submissions for 2nd Place Cohere Challenge (400+ Participants)
- Implemented **Flask** with a **Python** back-end to handle user input and query a custom-trained Cohere **Large Language Model**
- Configured a two-step query in the backend using contextual redundancy, **improving accuracy** of the AI model **by 25%**

Fitness Club Management System – *Java, PostgreSQL*

- Implemented registration, scheduling and payment in a Java CLI app integrated with a **PostgreSQL** database with 10+ entities
- Built a JDBC-based data access layer for a quick and secure connection, minimizing vulnerabilities such as **SQL injection**
- **Reduced query response time by 25%** through the addition of optimized indexing and **in-memory chaching** in Java

Search Engine Implementation – *Java, JavaFX GUI*

- Developed a search engine and web crawler in Java using Abstraction and Encapsulation to increase modularity
- Leveraged Java objects to store Page-Rank algorithm calculations in binary files, organizing queries and minimizing runtime
- Created a GUI using the **Model-View-Controller Architecture** for seamless integration of backend algorithms, intuitive user interaction, and event-driven functionality, ensuring robust separation of components and scalability in system architecture

Scheduling System – *Firebase, TypeScript, CSS, HTML*

- Architected a web-based employee organization system using **TypeScript**, **CSS** and **HTML** for long-term shift management
- Integrated **Cloud Firestore** as a NoSQL document database, ensuring seamless synchronization across multiple clients
- Managed the project following the **SDLC Waterfall Model**, ensuring organized milestones and timely completion