Alex Lee

Waterloo, Canada | a55lee@uwaterloo.ca | LinkedIn | GitHub | Portfolio

EDUCATION

University of Waterloo   Sep. 2023 - Apr. 2028
Bachelor of Mathematics, Major in Data Science   *Waterloo, ON*

Minors: Combinatorics and Optimization, Management
Relevant Coursework: Data Structures, Algorithms, OOP, Statistics, Linear Models

SKILLS

Languages: Python, SQL(MySQL, PostgreSQL, MongoDB), R, Java, C/C++, C#, Bash
Libraries: Scikit-learn, TensorFlow, PyTorch, Pandas, NumPy, OpenCV, Matplotlib
Tools: Git, Linux, AWS, Express, Spring, Power BI

EXPERIENCE

Machine Learning Engineer   Jan. 2026 – Aug. 2026
City of Edmonton - Future Cities Institute   *Edmonton, AB*

- Architected and deployed **CityVision**, an open-source real-time traffic control software, achieving **65% cost savings** in city infrastructure operations through automated vehicle detection.
- Optimized a **YOLOv11** vehicle detection model with an automated data pipeline on **GCP** for continuous training, improving model inference efficiency and lifecycle management.
- Engineered a real-time monitoring dashboard using **Shiny R** to provide stakeholders with interactive traffic analytics and live insights for infrastructure decision-making.
- Containerized the entire application stack using **Docker** to ensure a scalable environment and streamlined deployment via **CI/CD pipelines** (GitHub Actions/GCP).
- Collaborated in an **Agile** environment, regularly presenting technical progress and model performance metrics to stakeholders to facilitate data-driven urban policy improvements.

Fullstack Developer   May. 2025 - Aug. 2025
Association of Korean Canadian Scientists and Engineers   *Waterloo, ON*

- Led the **team of 6** to develop the official AKCSE website using **Express** and **MongoDB**, improving accessibility to career and academic help resources for students.
- Optimized query efficiency and database scalability by **300%** through implementation of **dynamic CRUD**, while implementing **authentication** and access control features to strengthen data security.

PROJECTS

Computer Vision Football Analytics | GitHub | Link
- Trained a **YOLOv11** model with **10,000+** images, achieving **0.877** mAP50 with 35.7 ms per-frame latency.
- Deployed services on **AWS EC2** with **SQS**, and built a **Next.js** web app for video upload and real-time analysis.

FBREF Football Data Analysis | GitHub
- Collected **100,000+** football match data using **Selenium** and organized the data into a **Pandas DataFrame**.
- Identified **progress passing distance** as key predictor of math results, suggesting focused strategies to teams.

Academic Management System | *Spring, Javascript, HTML/CSS, MySQL, jQuery, Bootstrap* | GitHub
- Built a full-stack academic management web app of **20+** pages with **50+** users using **Spring** and **MySQL**.
- Distributed project on **AWS EC2** with **Apache Tomcat**, with optimized database schema and RESTful APIs.
- Implemented **10+** essential features, **CRUD** operations of course postings and assignments, self implemented real-time chat, custom course search filters, and dynamic operations and views with the database.
- Reduced query response time by **30%** using nested SELECT statements to handle grouped ID increments.
- Ensured reliability with **200+** test cases and resolved issues such as multiple PK, time zone mismatches.

CERTIFICATIONS

- **Machine Learning Specialization**, Stanford University | Credential
- **Deep Learning Specialization**, DeepLearning.AI | Credential