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++, Bash
Libraries: Scikit-learn, TensorFlow, PyTorch, Pandas, NumPy, OpenCV, Matplotlib
Tools: Power BI, Tableau, Seaborn, Git, Linux, AWS

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.

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

- Designed and implemented **MongoDB** schemas and **Express** APIs for the official AKCSE platform, structuring member, event, and resource data for efficient querying and future analytics.
- Optimized query patterns and indexing strategy, improving database throughput and reducing response times by approximately **3x** for core user flows.
- Implemented authentication, role-based access control, and input validation across CRUD operations to safeguard member data and maintain data integrity.

Projects

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.

Credit Card Fraud Detection | GitHub

- Developed credit card fraud classification model using **sklearn** and **TensorFlow** with **96%** prediction accuracy.
- Processed and cleaned **200,000+** transaction records, focusing on handling imbalanced financial datasets.

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.

Certifications

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