

Ali Lesani

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SUMMARY

AI researcher and PhD candidate at the University of Waterloo specializing in applied machine learning, computer vision, and vision–language models. Experienced in translating AI research into end-to-end solutions, from model development to cloud deployment.

WORK EXPERIENCE

AI & ML Researcher (PhD Candidate) | CVISS Lab, UWaterloo Sep 2023 – Present

- Developing a domain-specific vision–language model for spatio-temporal change captioning in longitudinal infrastructure imagery.

Kisoji Biotechnology Inc. Aug 2025 – Sep 2026

- **AI Scientist | June 2026 – Sep 2026**
 - Developed an extensible pipeline to extract antibody representations from multiple **protein language models**, reduce dimensionality with UMAP, and prioritize VHH candidates near reference binders for lab validation.
 - Implemented **masked language model** (MLM) training to adapt VH/VL-focused language models to VHH antibody sequences.
- **AI Engineer | Aug 2025 – May 2026**
 - Architected and deployed an **agentic RAG** platform enabling natural-language querying over internal documents and structured databases, implementing end-to-end RAG pipelines and **intelligent tool routing** between document retrieval and **NL-to-SQL**, delivered via CLI and Streamlit on **AWS**.
 - Built an automated PDF image extraction and classification system using embedding-based similarity, exposed through a **FastAPI REST API** with web UI and CLI support.
 - Architected and deployed scalable cloud infrastructure on **AWS**, configuring VPC networking and IAM, containerizing multi-service applications with **Docker and Docker Compose**, serving via **Nginx**, and automating deployments using **GitHub Actions CI/CD**.

AI Research Intern | Nav Canada Jan 2026 – May 2026

- Built a computer vision framework to compute Runway Occupancy Time (ROT) by detecting and tracking aircraft in airport video feeds, using SAHI-enhanced **small-object detection** with a custom Kalman-filtered episode state machine. [\[Github\]](#)

NLP Specialist (RA) | Office of Associate Dean, UWaterloo Jan 2025 – Aug 2025

- Built an automated **NLP** system to classify and filter student course evaluation comments using **Sentence Transformer embeddings** (all-MiniLM-L6-v2) and a **KNN-based** classifier for institutional deployment.

AI Research Intern | Rogers Communications Sep 2024 – Dec 2024

- Developed SDG-SAM, a zero-shot instance **segmentation** pipeline for fine-grained cell tower component detection in **UAV imagery** under heavy clutter and occlusion. [\[Github\]](#)

SKILLS

Languages:	Python, C++
AI/ML:	PyTorch, HuggingFace, Scikit-learn, OpenCV, LangChain
Large Models:	Qwen, LLaVA, BERT, Protein Language Models, LoRA Adaptors, SFT, DPO
APIs & Apps:	FastAPI, Streamlit
Data & Databases:	Pandas, SQL
Cloud & DevOps:	AWS, Docker, Nginx, GitHub Actions

SCHOLARSHIPS, HONORS AND AWARDS

• 1st Place , 2025 NSF NHERI GSC Data Challenge – Awarded for top AI research in natural hazards.	2025
• Winner of UW Graduate Scholarship , University of Waterloo.	2024
• International Doctoral Student Award , University of Waterloo.	2023
• Graduate Research Studentship , University of Waterloo.	2023
• National Elites Foundation Award , Sharif University of Technology.	2019
• Ranked 1st , 24 th Regional Scientific Olympiad in Civil Engineering.	2019
• Ranked 1st , Among More than 44 Peer B.Sc. Students, Sahand University of Technology.	2019

EDUCATION

PhD in Engineering | University of Waterloo | GPA: 99.67/100 (4/4) 2023 – Present

- Coursework: Pattern Recognition, Intro to AI, Deep Learning, Computational Vision, Intro to NLP, Information Theory

MSc in Engineering | Sharif University of Technology | GPA: 3.87/4 2019 – 2022

- Coursework: Intelligent Systems, Probabilistic Modeling, Machine Learning

BSc in Engineering | Sahand University of Technology | GPA: 3.96/4 2015 – 2019