

ALIREZA LAALMANESH

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EDUCATION

University of Waterloo

Waterloo, Canada

Master of Mathematics in Computational Mathematics (Co-op)

Sep. 2025 -- Present

- Awarded the i-Comp-Data Fellowship (Inter-faculty award for Computation & Data research).
- Advisors: Dr. David Del Rey Fernández & Dr. Leia Minaker.
- Research Areas: Numerical Analysis, Deep Learning applications in Urban Data Science, Discrete Event Simulation.

Amirkabir University of Technology (Tehran Polytechnic)

Tehran, Iran

B.Sc. in Industrial Engineering & Information Systems

2019 -- 2024

- Cumulative GPA: 3.5/4.0.
- B.Sc. Thesis: "Operating Room Scheduling utilizing Meta-heuristic Optimization Algorithms".

TECHNICAL SKILLS

Languages: Python, C/C++, Bash Scripting

AI & Data Science: PyTorch, scikit-learn, CNN Architectures (EfficientNet), DeepInsight, XGBoost

Mathematical Context: Linear Algebra, Numerical Optimization, Loss Function Implementation, Stochastic Modeling

PROFESSIONAL EXPERIENCE

University of Waterloo

Waterloo, Canada

Graduate Teaching Assistant (Faculty of Mathematics)

Sep. 2025 -- Present

- Courses: Calculus 2 for Sciences, Applied Linear Algebra, Algebra for Honours, Linear Algebra for Engineering.
- Conducted weekly tutorials and office hours to support student learning.
- Responsible for grading assignments and examinations.

TAV Institute

Tehran, Iran

Intern - Layout Design

2024

- Contributed to factory layout analysis and process flow modeling.
- Assisted in capacity analysis regarding material handling systems.

SELECTED PROJECTS & RESEARCH

Academic Hub Automation | *Linux Integration*

- Implementation of a local system to bridge Linux environments with Microsoft 365 services.
- Uses email transport layers for notification and calendar synchronization.

Server Config Utility | *Bash, Linux Admin*

- Bash script designed for the initialization of headless Linux servers.
- Automates Tailscale and XRDP configuration for remote access setup.

CrashVision-DL: Traffic Severity Prediction | *PyTorch, DeepInsight*

- Pipeline construction for converting tabular data (7.7M records) into feature images using t-SNE.
- Utilization of a custom Soft F-Beta loss function ($\beta=2.0$) to address recall in fatal crash detection.

Android Hardware Bridge | *Linux, USB/IP*

- Configuration of Android devices as USB servers using USB/IP protocols.
- Involves binary injection via ADB to expose hardware interfaces over TCP/IP.

CodeBase Aggregator | *Python, File I/O*

- Utility script for aggregating code repositories into structured datasets.
- Facilitates code analysis and context handling for Large Language Models (LLMs).

Scientific Content Pipeline | *Gemini Vision, Python*

- ETL pipeline using PyMuPDF and Gemini Vision for converting scientific documents into audio notes.
- Features non-blocking architecture for text parsing and audio generation.

HONORS & AWARDS

- **i-Comp-Data Fellowship:** Inter-faculty award for research in Computation & Data.
- **Ranked in Top 1%** in National University Entrance Exam (among approx. 150,000 candidates).
- Merit-based Scholarship recipient at Amirkabir University of Technology.