

# Omid Reza Heidari

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## RESEARCH INTERESTS

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Multimodal AI | Large Language Models | Reinforcement Learning | Computer Vision | Optimization

## EDUCATION

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**Concordia University**, *Montreal, CA*

Master of Science in Computer Science

Advisers: Yang Wang and Xinxin Zu

Research project: Domain Shifts in Object Detection in X-ray Images

2023 - 2025

GPA: 3.5/4.00

**Islamic Azad University**, *Zanjan, IR*

Bachelor of Engineering in Computer Engineering

2017 - 2022

GPA: 3.47/4.00

## WORK EXPERIENCE

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**Vita Detection**

*Machine Learning Intern*

*Montreal, CA*

Apr 2025 - Present

- Developed and implemented domain adaptation techniques for object detection in security X-ray images, applying the Align and Distill (ALDI) method to enhance model robustness.
- Designed and optimized deep learning models using PyTorch and PyTorch Lightning on Amazon Web Services (AWS) and Compute Canada for large-scale experiments.
- Analyzed and benchmarked multiple approaches for cross-domain object detection, improving model generalization under domain shifts.

**The University of British Columbia**

*Machine Learning Intern*

*Vancouver, CA*

Nov 2024 - Feb 2025

- Implemented the state-of-the-art models in PyTorch and PyTorch Lightning, such as OmniMotion, Real NVP, “Betrayed by Attention”, and Neural Radiance Fields (NeRF) on Google Cloud Platform (GCP) and Compute Canada.
- Reviewed and discussed approximately 5-7 research papers per week, analyzing various approaches to improve the performance and accuracy of previous methodologies.
- Enhanced model accuracy for detecting occluded objects by around 7%.

**Zanjan University of Medical Science**

*Data Research Analyst*

*Zanjan, IR*

Jul 2022 - Jan 2023

- Conducted research on Machine Learning and Electroencephalogram signals.
- Utilized Welch, Convolution, and Fourier transform to compute connectivity, power, and amplitude.
- Applied low-data techniques, such as data augmentation and transfer learning, to prevent underfitting and improve model performance on limited datasets.

## ACADEMIC EXPERIENCE

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**Concordia University**

*Teaching Assistant*

*Montreal, CA*

Jan 2024 - Present

- COMP 6771 - Image Processing (Yiming Xiao)
- COMP 6321 - Machine Learning (Yang Wang and Ali Ayub)
- COMP 248 - Object-Oriented Programming I (Nora Houari)
- COEN 352 - Data Structures and Algorithms (Aiman Hanna)
- COMP 353 - Databases (Nematollaah Shiri and Khaled Jababo)
- COMP 352 - Data Structures and Algorithms (Bahareh Goodarzi)
- COEN 243 - Programming Methodology I (Xinxin Zu and Honghao Fu)
- COMP 6961 - Graduate Seminar in Computer Science (Juergen Rilling)

**Sharif University of Technology**

*Teaching Assistant*

*Tehran, IR*

Sep 2022 - Feb 2023

- CE 717 - Machine Learning (Ali Sharifi-Zarchi and Behrooz Azarkhalili)

- Digital Logic Design (Ali Azarpeyvand)
- Computer Architecture (Ali Azarpeyvand)
- Principles of Database Design (Davud Mohammadpur)

## SKILLS

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- **Programming Languages:** Python, MATLAB, C++
- **Frameworks:** PyTorch, PyTorch Lightning, Scikit-learn, PySpark, OpenCV
- **Databases:** MySQL, PostgreSQL, Redis, MongoDB
- **Services:** AWS, GCP, RabbitMQ
- **Languages:** English (fluent), French (fluent), Persian (fluent)

## PROFESSIONAL SERVICE

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### Ethics Reviewer

Jul 2025

Reviewed five papers for the *NurIPS 2025* Datasets and Benchmarks Track.

## PUBLICATIONS

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### 2025

- **Heidari, O. R.**, Wang, Y., Zuo, X. ALDI-ray: Adapting the ALDI Framework for Security X-ray Object Detection. *Submitted to ICASSP 2026 Conference*
- **Heidari, O. R.**, Reid, S. , Yaakoubi, Y. AgentiQL: An Agent-Inspired Multi-Expert Architecture for Text-to-SQL Generation. *Submitted to NeurIPS 2025 Workshop*
- Yousefi, F., Dadashi, M., **Heidari, O. R.** Efficacy of left prefrontal-temporoparietal tDCS on symptom reduction and cognitive improvement in schizophrenia: A randomized, sham, controlled, parallel-group study. *Brain Stimulation Journal*

### 2024

- Wasi, A. T., **Heidari, O. R.\***, Anam, N.\*, Hasan Rafi, T. A Review of Human-Centric Evaluation of Cultural Bias in Indic Languages within LLMs: Rethinking Research Directions.
- **Heidari, O. R.\***, Gu, L.\*, Li, J. N.\*, Wang, Y. Retrieval Augmented Generation for Natural Language Query in Egocentric Videos. 🏆 *Selected as the Best Poster at Mila - Quebec AI Institute*

### 2023

- Zakerian Zadeh, A., Dadashi, M., **Heidari, O. R.** Assessment of Structural Connectivity and Brain Volumes after tDCS in Stroke: A Machine Learning Method. *Authorea (Preprint)*