

# Omid Reza Heidari

omid.orh@gmail.com | 514-994-3355 | omid-reza.github.io | Montreal, CA

## 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*

2023 - 2025

Master of Science in Computer Science

GPA: 3.5/4.00

Advisors: Dr. Yang Wang and Dr. Xinxin Zuo

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

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

2017 - 2022

Bachelor of Engineering in Computer Engineering

GPA: 3.47/4.00

## WORK EXPERIENCE

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**Vita Detection**

*Montreal, CA*

*Machine Learning Intern*

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 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**

*Vancouver, CA*

*Machine Learning Intern*

Nov 2024 - Feb 2025

- Implemented the state-of-the-art models including OmniMotion, real-valued non-volume preserving (Real NVP), Betrayed by Attention, and Neural Radiance Fields 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 Sciences**

*Zanjan, IR*

*Data Research Analyst*

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**

*Montreal, CA*

*Teaching Assistant*

Jan 2024 - Present

- Machine Learning & AI:
  - COMP 6771 - Image Processing (Dr. Xiao)
  - COMP 6321 - Machine Learning (Dr. Wang & Dr. Ayub)
  - COMP 6961 - Graduate Seminar in Computer Science (Dr. Rilling)
- Programming & Software Engineering:
  - COMP 248 - Object-Oriented Programming I (Dr. Houari)
  - COEN 243 - Programming Methodology I (Dr. Zuo and Dr. Fu)
- Data Structures & Algorithms:
  - COEN 352 - Data Structures and Algorithms (Dr. Hanna)
  - COMP 352 - Data Structures and Algorithms (Dr. Goodarzi)
- Databases:

## Sharif University of Technology

Teaching Assistant

Tehran, IR

Sep 2022 - Feb 2023

- CE 717 - Machine Learning (Dr. Sharifi-Zarchi and Dr. Azarkhalili)

## University of Zanjan

Teaching Assistant

Zanjan, IR

Sep 2021 - Jun 2022

- Digital Logic Design (Dr. Azarpeyvand)
- Computer Architecture (Dr. Azarpeyvand)
- Principles of Database Design (Dr. 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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### Reviewer

Sep 2025

*NeurIPS 2025 - Efficient Reasoning workshop.*

### Ethics Reviewer

Jul 2025

*NeurIPS 2025*

## PUBLICATIONS

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### 2025

- Reid, S., Chi, Z., Gu, L., **Heidari, O. R.**, Wang, Z., Wang, Y. LoRA Merging for Few-Shot Test-Time Domain Adaptation Using CLIP. *Submitted to ICLR 2026 Conference*
- **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. 🏆 *Best Poster, 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)*