Omid Reza Heidari

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RESEARCH INTERESTS

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

EDUCATION

Concordia University, *Montreal, CA* 2026 - 2029
Doctorate of Industrial Engineering
Supervisor: Prof. Yassine Yaakoubi

Concordia University, *Montreal, CA* 2023 - 2025
Master of Science in Computer Science GPA: 3.5/4.3
Advisors: Prof. Yang Wang and Prof. 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

Vita Detection *Montreal, CA*
Research Intern Apr 2025 - Aug 2025

- 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*
Research 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

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:
  - COMP 353 - Databases (Dr. Shiri and Dr. Jababo)

Sharif University of Technology *Tehran, IR*
Teaching Assistant Sep 2022 - Feb 2023

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

University of Zanjan *Zanjan, IR*
Teaching Assistant Sep 2021 - Jun 2022

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

SKILLS

- **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

Reviewer Sep 2025 - Oct 2025
NeurIPS 2025 - Efficient Reasoning workshop.

Ethics Reviewer Jul 2025 - Jul 2025
NeurIPS 2025

PUBLICATIONS

2026

- **Heidari, O. R.**, Reid, S., Yaakoubi, Y., Wang, Y. AGENTIQL: Agentic LLMs with Adaptive Routing for Text-to-SQL. *In preparation for ICML 2026 Conference*

2025

- Reid, S., Chi, Z., Gu, L., **Heidari, O. R.**, Wang, Z., Wang, Y. DA-MergeLoRA: Hypernetwork-Based LoRA Merging for Few-Shot Test-Time Domain Adaptation. *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*
- 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. *Submitted to PAKDD 2026 Survey Track*
- **Heidari, O. R.**, Reid, S., Yaakoubi, Y. AGENTIQL: An Agent-Inspired Multi-Expert Architecture for Text-to-SQL Generation. *NeurIPS 2025 Workshop on Efficient Reasoning*
- 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

- **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*