Aysan Aghazadeh

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Education

University of Pittsburgh Sep. 2021 – Sep. 2026
Ph.D. in Computer Science, Advisor: Dr. Adriana Kovashka *Pittsburgh, PA*

Interest: Computer Vision, Multimodal Reasoning, Generative AI, Foundational Models (MLLMs, and LLMs)

Amirkabir University of Technology Sep. 2014 – July 2019
B.Sc. in Computer Engineering, *Tehran, Iran*

Publications

Aysan A., Adriana K., "Sense it with your eyes: Sensation Generation and Understanding for Advertisements", Submitted to **ICLR 2026**

Aysan A., Adriana K., "The Face of Persuasion: Analyzing Bias and Generating Culture-Aware Ads", **EMNLP 2025**

Aysan A., Adriana K., "CAP: Evaluation of Persuasive and Creative Image Generation", **ICCV 2025**

Aysan A.*, Sina M.*, Ashmit K., Adriana K., "Benchmarking VLMs' Reasoning About Persuasive Atypical Images", **WACV 2025.**

Aysan A., Maryam A., "A Distributed Approximate Nearest Neighbor Method for Real-Time Face Recognition"

Experience

Graduate Research Assistant at University of Pittsburgh 2022 - Present | Pittsburgh, PA
Multimodal/ LLMs(MLLMs/LLMs), Text-to-Image(T2I) Models, LoRA Fine-tuning, RLHF training, Image Evaluation

- Benchmarked the MLLMs on two novel Sensation Classification tasks. (**Image Understanding**)
- Introduced the sensory image generation task and the corresponding dataset. (**Image Generation**)
- Introduced an evaluation metric to assess how well an image evoke a sensation improving the agreement with human by 56%. (**Image Evaluation - RLHF Fine-tuning, LoRA Fine-tuning**)
- Analyzed the demographic bias in advertisement data, T2I models for persuasive image generation, and MLLMs/LLMs as a judge for persuasion. Proposed a method to generate cultural advertisements improving the performance by 7%. (**Image Generation - T2I Models, T2I Model Fine-tuning**)
- Proposed an evaluation framework for advertisement image generation to evaluate the text-image alignment, creativity, and persuasion of images. Improved the agreement with human by 0.37, 0.5, and 0.53 out of 1 compared to baselines. Benchmarked T2I models in generating creative and persuasive images from implicit messages, highlighting the struggle of the models. (**Image Evaluation - LoRA Fine-tuning, RLHF Fine-tuning**)
- Introduced a benchmark with three complex reasoning tasks on atypicality understanding. (**Image Reasoning - Adversarial Data Generation**)
- Proposed an atypicality-aware chain-of-thought prompting to reason on unusual Ad images improving the performance by 30%. (**Image Reasoning - CoT Prompting**)

Deep Learning - Computer Vision Intern at Cellanome Summer 2022 | Palo Alto, CA
Medical Image Segmentation, Object Detection

- Initiated deep learning approaches for **object detection and medical image segmentation** and improved the accuracy of the image segmentation by 30%.
- Led the development of diverse methodologies and created a specialized dataset for medical image segmentation.
- Conducted groundbreaking research on transfer learning and semi-supervised learning, primarily focusing on their applications in medical image segmentation.
- Proposed a memory-efficient model for high-density instance segmentation, significantly advancing the company's capabilities in this domain.

Technical Skills

Languages Python, Java, MATLAB, C/C++, SQL, R
ML & Deep Learning PyTorch, Transformers, NLTK, OpenCV, Numpy, Scikit-learn, Pandas, Tensorflow, Keras
Cloud Services Amazon AWS, Oracle Cloud
Web Programming HTML/CSS, Javascript, Flask, jQuery
Database MongoDB, MySQL
Tools Git, Docker, LaTeX, Postman, RapidMiner Studio, ImageJ, ITK-SNAP
Misc Data Cleaning, MVC, Problem Solving

Presentations

- *(Invited Talk)*, From Few to None: Exploring Few-Shot, One-Shot, and Zero-Shot Deep Learning in Clinical Settings tutorial, **ISVC'23, BHI'23**

Projects

Reasoning Capabilities of VLMs and LLMs

PyTorch, Transformers, VLMs, LLMs

- Designed an evaluation pipeline to compare the performance of VLMs (e.g., BLIP-2) and the corresponding LMs (e.g., FlanT5) in **complex reasoning** tasks such as Theory of Mind (ToM), Riddle Sense, and Social Interaction Question Answering, etc. Highlighted the superiority of LLMs' performance in complex reasoning tasks.
- Evaluated the **robustness** of VLMs and LLMs to the more complex forms and showed that VLMs are more robust than LLMs.

Re-ranking the answers of common sense question answering

Python, PyTorch, Ranking Evaluation, Answer Ranking

- Proposed a novel method for **re-ranking** the GPT-generated answers to the **common-sense questions** to have the more frequent responses in the forefront. Fine-tuned the ALBERT to choose between every two answers. Increased the **ranking score** by 13%, reducing the gap between the response and **oracle score**.

Exploring Domain Shift in Abstract Summarization

PyTorch, Transformers, Language Models (LMs)

- Designed and Developed various pipelines for abstract **summarization tasks** utilizing language models, such as BART and PEGASUS. Highlighted the drop in the performance of both models when evaluating the model on the unseen datasets.

Professional Services

- **Conference Reviewer:** CVPR 2025, and Demographic Diversity in Computer Vision Workshop at CVPR 2025

Honors and Awards

- **Travel Award**, Department of Computer Science University of Pittsburgh (2025)
- **Honored as an outstanding student**, Amirkabir University of Technology (2014-2019)

Extra Curricular & Leadership

Member of Scientific Student Chapter Jan. 2017 – March 2018
Amirkabir University of Technology, Computer Engineering Department *Tehran, Iran*

- Organized over 70 national and international events, collaborated internationally with Technische Universität München, Germany, and KTH Royal Institute of Technology, Sweden.
- I was the head of "AUT DMC" executive team, the first Data Mining Contest at AUT.
- Our team was awarded the best organization of the year in 2018.