Aysan Aghazadeh

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Education

University of Pittsburgh Sep. 2021 – April 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., "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/ Large Language Models, Text-to-Image Models, RLHF training, LoRA, Image Evaluation

- **Image Understanding -** Conducted research on reasoning on images with unusual representation of objects. Introduced a benchmark with three complex reasoning tasks and proposed a method simulating atypicality-aware chain-of-thought to interpret advertisement images. Improved the performance by 30%.
- **Image Generation -** Introduced the task of generating advertisement images that evokes specific sensations and the corresponding dataset, and proposed a method to generate a persuasive and creative images that evokes an specific sensation sensation. Analyzed the bias in advertisement data and existing text-to-image models and proposed a method to generate cultural advertisements improving the performance by 7%.
- **Image Evaluation -** Proposed two novel evaluation metrics to evaluate the persuasiveness and creativity in T2I tasks improving the agreement with human annotations by 0.40 and 0.51 out of 1 respectively. Proposed an evaluation metric for abstract text and image alignment utilizing MLLMs and fine-tuned LLMs with Contrastive Preference Optimization. Improved the agreement with human annotation for text-image alignment by 0.59 out of 1. We futher proposed an evaluation metric on how well generated images evoke specific sensation when generating sensoryADs. Analyzed the gender and racial bias in MLLMs and LLMs when acting as a judge for persuasion of images or description of the image.
- **Commonsense QA** - Conducted research on various aspects of commonsense question-answering. Investigated evaluation methods, datasets, and cutting-edge approaches to advance the understanding and application of commonsense in AI systems.

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)* Introduction to Labeled-Efficient Deep Learning Approaches, From Few to None: Exploring Few-Shot, One-Shot, and Zero-Shot Deep Learning in Clinical Settings tutorial, **BHI'23**
- *(Invited Talk)* Introduction to Few-shot learning on Medical Images, Explainable Deep Few-shot Learning on the Oracle Cloud and its Application in Medical Imaging Informatics tutorial, **ISVC'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, 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.