Mahvash Siavashpour

NLP & LLM Specialist · Graduate Machine Learning Research Assistant · Computer Science

University of Alberta, Canada

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Highlights of Qualifications

Machine Learning Engineer and AI Researcher with 5+ years of experience in Large Language Models (LLMs), NLP, Reinforcement Learning, and Deep Learning. Skilled in developing agentic AI systems, evaluation pipelines, and Retrieval-Augmented Generation (RAG) applications. Strong background in using PyTorch, HuggingFace, LangChain, Docker, SLURM, and Azure. Published at MedInfo, SemEval, COLING, and CogSci.

Education

Master of Science in Computer Science — *Canada*

University of Alberta, *GPA: 3.9/4* — *2023 – 2026 (Expected)*

- Thesis: Large Language Models for Enhancing Surgical Triage Decision-Making

Bachelor of Computer Engineering (Artificial Intelligence) — *Iran*

Amirkabir University of Technology, *GPA: 3.9/4* — *2018 – 2023*

Industry Experience

Associate Machine Learning Developer — *Canada*

AltaML — *2025 – Present*

- Built **agentic systems** for document processing and data analysis using **LangChain**
- Developed a realtime evaluation pipeline using **LLM-as-a-judge**
- Implemented a Retrieval-Augmented Generation **(RAG)** chatbot

Work Integrated Learning Opportunity (WILO) — *Canada*

Amii — *2024 – 2025*

- Co-authored technical reports and translated ML concepts for non-technical stakeholders
- Proposed AI solutions to 5+ startups across health tech, vision, and forecasting domains

Research Experience

Research Assistant — *Canada*

University of Alberta — *2024 – Present*

- Benchmarked a novel clinical task with LLM decision-makers, improving ROC-AUC by 10% on real-world data
- Used techniques such as **fine-tuning** and **post-training (DPO)** of LLMs for optimized performance
- Incorporated **LLM reasoning** and **CoT** prompting
- Investigated synthetic data generation using LLMs for dataset augmentation

Research Assistant — *Iran*

Amirkabir University of Technology — *2022 – 2023*

- Designed a novel transformer-based (BERT) sequence-labeling approach for joint punctuation insertion and sentence boundary detection, with benchmarking against standard baselines

Research Intern — *Iran*

Institute for Cognitive and Brain Sciences — *2021 – 2023*

- Created a model for human lexical decision-making using machine learning, evidence accumulation models, and Bayesian methods

Publications

A Multimodal Deep Learning Ensemble Framework for Building a Spine Surgery Triage System
MedInfo 2025.

Semi-Automated Construction of Sense-Annotated Datasets for Practically Any Language
COLING 2025

UAlberta at SemEval-2024 Task 1: A Potpourri of Methods for Quantifying Multilingual Semantic Textual Relatedness and Similarity
SemEval@NAACL 2024

Modeling Human Lexical Decision-Making with Artificial Neural Networks and Evidence Accumulation Models
CogSci 2023

Skills

Programming: Python, C/C++, SQL, Java, Bash

Frameworks & Tools: PyTorch, TensorFlow, HuggingFace, LangChain, scikit-learn, Keras, AutoGen, Matplotlib

Other: Docker, W&B, Git, SLURM, Microsoft Azure, Distributed Training

Honors & Awards

Deep Learning and Reinforcement Learning Summer School (DLRL) – Admitted, *2025*

NSERC CREATE FD2D Fellowship **($30K/year)**, *2024*

UAlberta Graduate Recruitment Scholarship **($5K)**, *2023*

1st Place — ACM ICPC (Juniors), Amirkabir University of Technology, *2018*

Projects

Occam Shaving in PPO

- Simplified PPO implementation to identify essential components and match SOTA performance with fewer heuristics

Predicting Semantic Textual Relatedness Using LLMs

- Designed prompting strategies (zero-/few-shot, chain-of-thought, and self-consistency) to predict semantic relatedness of sentence pairs

Exploration in Reinforcement Learning

- Proposed a count-based exploration method for tabular Q-learning using UCB with sample-efficiency improvements over baselines

News Search Engine

- Built an IR engine using TF-IDF, BM25, K-means, and Elasticsearch for high-speed retrieval

Additional Activities

Volunteer at Reinforcement Learning Conference (RLC) 2025

Lab manager at the Amii Lab at the University of Alberta (2024 – 2025)