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RESEARCH INTEREST

Deep Learning Theory, Multi-Modal Learning, Natural Language Processing, LLMs, Probabilistic Learning

EDUCATION

Master of Applied Science in Applied Mathematics <i>Polytechnique Montreal</i>	2024 – 2026 CGPA: 3.9/4.0
Bachelor of Science in Applied Mathematics, minor in Computer Science <i>AmirKabir University of Technology</i>	2017 – 2022 CGPA: 3.5/4.0

PUBLICATIONS

A Probabilistic U-Net Approach to Downscaling Climate Simulations <i>NeurIPS 2025 AI4Science — M Alipourhajiagha, P Lemaire, Y Diouane, J Carreau</i>	10/2025
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PROFESSIONAL EXPERIENCE

Visiting Researcher <i>Ouranos</i>	06/2025 – Present
<ul style="list-style-type: none">Conducting applied research as an AI Research Intern at Ouranos, a climate adaptation research hub in Quebec, on probabilistic downscaling models with an emphasis on making models' behavior interpretable.	
Graduate Research Assistant <i>Mila - Quebec Artificial Intelligence Institute</i>	01/2024 – Present
<ul style="list-style-type: none">Developing a multi-variate probabilistic U-Net model for statistical downscaling of climate projections, leveraging deep learning advancements to improve spatial resolution, physical coherence, and inference speed.	
Graduate Teaching Assistant <i>Polytechnique Montreal</i>	01/2025 – Present
<ul style="list-style-type: none">Artificial Intelligence: Probabilistic and Learning Techniques (INF8225) – Prof. Chris PalFundamentals of Machine Learning (IFT6390) – Prof. Ioannis Mitliagkas & Dhanya SridharUnsupervised Learning and Time Series (MTH8304) – Prof. Julie Carreau	
Undergraduate Teaching Assistant <i>AmirKabir University of Technology</i>	02/2020 – 01/2022
<ul style="list-style-type: none">Numerical Computations – Prof. Fatemeh ShakeriFundamentals of Programming in C – Prof. Mohammad AkbariNumerical Analysis – Prof. Mostafa Shamsi	
Teaching Assistant <i>CS50x Iran</i>	08/2020 – 04/2022
<ul style="list-style-type: none">Contributed to teaching CS50x, Harvard's introductory computer science course, for a Persian-speaking audience. Translated and customized course content, and supported TA sessions in the 2020 and 2021 cohorts.	

TECHNICAL SKILLS

- **Programming & Scripting:** Python, C, Java, SQL, Bash, HTML/CSS
- **Libraries & Frameworks:** PyTorch, TensorFlow, Scikit-Learn, NumPy, Pandas, Hugging Face Transformers, Datasets, WandB, TensorBoard, Matplotlib, Seaborn, Plotly
- **Tools:** Git, Docker, MySQL, VSCode, Jupyter, Linux, LaTeX
- **Core AI/ML Knowledge:** Supervised and Unsupervised Learning, Deep Learning (CNNs, RNNs, Transformers), Probabilistic Modeling, Self-Supervised and Contrastive Learning, Transfer Learning and Domain Adaptation, Generative Models (VAEs, GANs, Diffusion Models), Evaluation Metrics and Benchmarking, Experiment Design and Ablation Studies, Model distillation, Interpretability and Explainability, Multi-GPU Training Workflows on Compute Canada (SLURM-Based Job Scheduling)

HONORS & AWARDS

UpperBound 2025 Talent Bursary – Alberta Machine Intelligence Institute (Amii): Spring 2025 Awarded a \$1500 (CAD) scholarship by Amii in recognition of research potential and talent in AI/ML, based in Edmonton, Alberta.

Academic Distinction — AmirKabir University of Technology: Spring 2022 Graduated in the top 15% of the cohort; overall CGPA 3.5/4.0; final two-year GPA 3.85/4.0.

Full Scholarship for B.Sc. in Applied Mathematics: Fall 2017 Ranked among the top 0.8% of all Iranian University Entrance Exam participants (150,000 participants) and received a full scholarship for a B.Sc. in Applied Mathematics from the Ministry of Science, Research, and Technology.

RELEVANT COURSES

M.Sc. Courses: Representation Learning (A), Natural Language Processing with Deep Learning (A+), Statistical Machine Learning (B+), Machine Learning Applied to Climate Change (A)

B.Sc. Courses: Advanced Programming in C++ (A+), Data Structures & Algorithms (A+), Database Systems (A+), Probability (A+), Foundation of Matrix and Linear Algebra (A+), Linear & Non-linear Optimization (A+), Data Mining (A), Introduction to Blockchain (B+), Artificial Intelligence (A+), Partial Differential Equations (A+), Dynamical Systems (A+), Computer Networks (A+), Numerical Analysis (A+)

CERTIFICATIONS

Machine Learning Specialization – Coursera (Offered by Stanford University)

Advanced Python Programming and OOP Thinking – Quera College

CS50: Introduction to Computer Science – Harvard University

PROJECTS

Emotion Recognition from Conversational Context 🌀

- Developed hybrid models (e.g., SS-BED and CNN-BiGRU) for emotion recognition in text to balance accuracy, speed, and resource efficiency, practical alternatives to transformer models in resource-constrained applications.

litgpt 🌀

- Implemented parameter-efficient instruction tuning by applying LoRA to TinyLlama and Pythia on LIMA and benchmarking zero-shot performance on HellaSwag, applied an improved LoRA variant and compared results.

Emotion-Detection 🌀

- Finetuning and evaluating transformer-based models like BERT, DistilBERT, GPT-2, RoBERTa, ELECTRA on diverse datasets like ISEAR, Diar AI, and GoEmotions to perform emotion classification on texts.

Sentiment Analysis 🌀

- Implementation and report of a sentiment analysis project comparing RNNs and Transformer models on the Yelp Polarity dataset, utilizing a BERT-based tokenizer for pre-processing.

DDPM: PyTorch Implementation 🌀

- Implementation of a Denoising Diffusion Probabilistic Models (DDPM) class using PyTorch on the MNIST dataset to minimize the loss function and generate MNIST images.

Human Activity Recognition 🌀

- Human Activity Recognition (HAR) using deep learning techniques, specifically MLP and 1D CNN, to classify six activities based on smartphone accelerometer time series data.

LANGUAGES

Persian: Native

English: Full Professional Proficiency (TOEFL iBT score: 103)

Turkish: Professional Working Proficiency

French: Elementary Proficiency