

Mahtab Farrokh

MACHINE LEARNING ENGINEER

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Highlights of Qualifications

- **5+** years of experience collaborating with interdisciplinary teams to tackle practical challenges using machine learning.
- **6+** years of experience with Python, PyTorch, Transformers, CUDA, and Scikit-Learn, including **2+** years in industry.
- Publications at top venues such as **ICML**, **IEEE ICASSP**, and leading medical informatics journals.
- **2** years of experience in software development and full-stack projects including React, Node.js, HTML/CSS, and SQL.

Relevant Experiences

Machine Learning Engineer

Edmonton, Canada

Alberta Machine Intelligence Institute (Amii), Clio

Jul 2024 - Now

- Led end-to-end development of an **LLM** pipeline leveraging GPT-4 and **Langchain** to automate legal document analysis, including timeline summarization, entity recognition, and date extraction with 83% accuracy.
- Developed **Docker-based** deployment pipeline with **FastAPI**, successfully transitioning to the production environment.
- Developed strong client communication and decision-making skills through leading weekly client meetings.
- **Tools:** Langchain, OpenAI, Docker, Transformers, FastAPI, Python, MLflow

Machine Learning Intern

Edmonton, Canada

Alberta Machine Intelligence Institute (Amii), MDA Space

Mar 2024 - Jun 2024

- Developed and optimized a **Retrieval-Augmented Generation (RAG) chatbot** for answering engineering questions.
- Performed **prompt engineering** on the RAG chatbot, utilizing hybrid search methods and reranking models, to enhance information retrieval accuracy by 20%.
- **Tools:** Langchain, HuggingFace, Open-Source LLMs, Chroma Vector DB, Milvus, Python

Mentor (2024) / Teacher Assistant (2023)

Montreal, Canada

Mila - AI4Good Lab

May 2023 - July 2024

- Designed lectures and served as a mentor for a training program for women and gender-diverse people across Canada.
- Led interactive discussions to ensure students' understanding of Neural Networks, Convolutional Neural Networks, Residual Neural Networks, Transformers, and more.

Research Assistant

Edmonton, Canada

University of Alberta

May 2021 - Dec 2023

- Introduced a novel pipeline for prostate cancer (PCa) recurrence prediction using tissue images, by utilizing **contrastive self-supervised learning** improved PCa prediction by **7%**, resulting in a publication in Journal of Pathology Informatics.
- Proposed a novel and effective evaluation metric for individualized survival probability prediction published in **ICML**.

Artificial Intelligence Developer

Tehran, Iran

Tebinja

Oct 2017 - May 2019

- Designed and implemented a web-based symptom checker using ensemble models, including DQN (Deep Q-network), Deep Neural Network, achieving 74% accuracy.
- **Tools:** Pytorch, Scikit-Learn, Python, Node.js, React, CSS.

Education

Master of Science in Computer Science

Edmonton, Canada

University of Alberta, Supervisor: Russ Greiner

Jan 2021 - Dec 2023

Bachelor of Computer Software Engineering

Amirkabir University of Technology

Tehran, Iran

Sep 2015 - Jan 2020

Notable Key Projects

Multilingual Alzheimer's Dementia Recognition through Spontaneous Speech

- Designed an ensemble-based model, securing 4th place in the ICASSP challenge with 70% test set accuracy.
- Developed interpretable, language-agnostic features inspired by clinical research on Alzheimer's dementia.
- Introduced a novel pause distribution analysis by fitting various probability density functions, enabling cross-lingual adaptability for Alzheimer's dementia prediction.

Dec 2023

Language Comprehension Assistance for Individuals with Autism

- Led a project to translate and paraphrase figurative language (e.g., idioms, metaphors, and sarcasm).
- **Fine-tuned** a T5 (Text-To-Text Transfer Transformer) model on figurative data, achieving a BLEU score of 0.72.

Jul 2023

Technical Skills

- **Programming/Scripting Languages:** Python, SQL, Javascript, C++, \LaTeX , Bash
- **Frameworks/Libraries:** Langchain, LlamaIndex, PyTorch, Keras, Numpy, Pandas, HuggingFace, Scikit-learn, JAX
- **Other Skills:** Docker, CUDA, Object-Oriented Programming, Linux, Git

Publications

Exploring Language-Agnostic Speech Representations using Domain Knowledge for Detecting Alzheimer's Dementia

IEEE International Conference on Acoustics, Speech, and Signal Processing

[Paper link](#)

Feb 2023

An Effective Meaningful Way to Evaluate Survival Models

ICML (International Conference on Machine Learning)

[Paper link](#)

Apr 2023

Learning to Predict Prostate Cancer Recurrence from Tissue Images

Journal of Pathology Informatics

[Paper link](#)

Nov 2023

The ACROBAT 2022 Challenge: Automatic Registration of Breast Cancer Tissue

Medical Image Analysis

[Paper link](#)

Jun 2024

Effective Survival Prediction for Cancer Patients

Under-review, BMC Bioinformatics

[Paper link](#)

Mar 2024

Community Involvement

Great Cycle Challenge

Edmonton, Canada

Volunteer

Aug 2021 - Aug 2024

- Biked more than 600 Km, and raised more than \$1.3k to support kids with cancer.
- Link to my fund-raising page: [\[click here\]](#)

Students Scientific Chapter (SSC)

Tehran, Iran

Academic Director

Sep 2017 - Dec 2018

- Elected as a member of Students Scientific Chapter(SSC), CEIT Department, Amirkabir University of Technology.
- Organized over 70 events to build community, enhance technical knowledge, and provide industry exposure for students.

AUT ACM ICPC

Tehran, Iran

Member of Execution Committee

Nov 2016 - Nov 2018

- Organized the 18th, 17th, and 16th International AUT ACM ICPC.