Mahtab **Farrokh**

GRAUDATE RESEARCH ASSISTANT

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Summary

Research assistant at the University of Alberta, focusing on learning accurate prediction models for medical imaging problems and using hidden representation learning approaches.
Interests: Machine Learning, Computer Vision, AI Applications in Healthcare

Education

University of Alberta — *Edmonton, Canada*
M.Sc. in Computing Science — *2021 - 2023*

AmirKabir University of Technology (Tehran Polytechnic) — *Tehran, Iran*
B.Sc. in Computer Software Engineering — *2015 - 2020*

Technical Skills

Programming Python3, C/C++, Matlab, Node.JS
Frameworks and Tools Pytorch, Keras, CUDA, Tensorflow, Numpy, Scikit, Pandas, OpenCV, Jupyter notebook

Work Experiences

Amii (Alberta Machine Intelligence Institute) — *Edmonton, Canada*
TECHNICAL ADVISOR — *May & Jun 2022*
- Participated in the delivery of an AI Research Planning & Initiation workshop to help TRex Bio company address their business problem of understanding regulatory T cell behavior in tissue as a vital step in creating revolutionary therapeutics.

Tebinja — *Tehran, Iran*
ARTIFICIAL INTELLIGENCE DEVELOPER — *Oct. 2017 - May 2019*
- Designed and implemented a web-based symptom checker system that takes the patients' symptoms as input and predicts possible disease using machine learning models.
- To address this problem, the results of 4 algorithms were merged: Bayesian Network, Decision Tree, DQN(Deep Q-network), and Deep Neural Network.
- The system was implemented using Python, Node.js and React.

Research Experiences

University of Alberta — *Edmonton, Canada*
M.SC. PROJECT — *May 2021 - Now*
- Improved prostate cancer's biochemical recurrence(BCR) prediction from pathology tissue images using a representation learning approach, under the supervision of Dr. Russell Greiner, and epidemiologist Dr. Peter Gann.

Amirkabir University of Technology — *Tehran, Iran*
B.SC. PROJECT — *Jan. 2019 - Apr. 2020*
- Designed and implemented a multi-label classification algorithm using link prediction to improve a symptom checker's diagnosis under the supervision of Dr. Maryam Amir Haeri.

Teaching Experiences

University of Alberta — *Edmonton, Canada*
TEACHING ASSISTANT — *2022 - 2021*
- List of courses: Intelligent Systems, Introduction to the Foundations of Computation II

Amirkabir University of Technology — *Tehran, Iran*
TEACHING ASSISTANT — *2016 - 2019*
- List of courses: Artificial Intelligence & Expert Systems, Engineering Statistics, Data Structure & Algorithms, Introduction to Python3 programming, Signals & Systems

Selected Certificates

AI for Medical Diagnosis — *Certificate*
Covered topics: Disease Detection with Computer Vision, Image Segmentation on MRI Images — *Aug. 2020*

Convolutional Neural Networks — *Certificate*
Covered topics: Object Detection, Face recognition (More Certificates are listed on my homepage) — *Sep. 2019*

Notable Key Projects

2022	**Automatic Registration of Breast Cancer Tissue - MICCAI 2022**, Our proposed method was in the top 10 accurate models. The task was to automatiucally register IHC to H&E whole slide images(WSIs) of breast cancer tissue. Used the ORB detector to find points of interest, and found the homography matrix H in the projective geometry.	*GitHub link*
2022	**Simulating Robot-Assisted Surgery**, This project involved different tasks such as: image registration, 3D model reconstruction, real-time tracker of robot's arm for my computer vision course project.	*GitHub link*
2021	**Adversarial Attack on Sentiment Analysis Task**, Proposed a new algorithm Text-GAN, which applies an Autoencoder on text and a GAN model learns to add noise to the latent space in the way that the new generated text fools the victim model.	*GitHub link*
2021	**Generated Differential Private Synthetic Data**, Proposed a new method PATE-ACGAN, which applies the PATE idea to an Auxiliary Conditional GAN	*GitHub link*
2020	**Circuit Element Detector** , Implemented using YOLO5 image object detection	*GitHub link*
2018	**Time Series Prediction**, Used srima model	*GitHub link*
2017	**Classical Search and Local Search algorithms**, AI Course Project by Python, implementation of BFS, DFS(unlimited, limited, iterative), A*, bidirectional, genetic, hill climbing, simulated annealing	*GitHub link*
2016	**Search Engine**, Data Structure Course Project by Python, implementation of BST, AVL (Balanced BST), TST, Balanced TST, Trie and HashMap using chaining approach based on LinkedList	*GitHub link*

Extracurricular Activity

Great Cycle Challange — *Edmonton, Canada*
Volunteer — *August 2021 and 2022*
- Biked more than 500 km, and raised more than 500$ in total(2 years) to support kids with cancer.
- Here is the link to my fund raising page.

Students Scientific Chapter(SSC) — *Tehran, Iran*
Member — *2017 - 2018*
- Elected as a member of Students Scientific Chapter(SSC), CEIT Department, Amirkabir University of Technology

Linux Festival — *Tehran, Iran*
Member of Execution Committee — *Spring 2017 and 2016*
- Organaized 9th and 8th National AUT Linux Festival

AUT ACM ICPC — *Tehran, Iran*
Member of Execution Committee — *Fall 2018, 2017 and 2016*
- Organaized 18nd, 17nd, and 16nd International AUT ACM ICPC

Data Mining Cup(DMC) — *Tehran, Iran*
Member of Execution Committee — *Fall 2017*
- Organaized 1st DMC for CS students in Amirkabir University of Technology