Delaram Hosseini

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Education

University of Tehran **Tehran, Iran**

Bachelor of Science in Computer Science *Sept 2020 – Present*

GPA: 16.35/20 (Equivalent to 3.4/4) during the last two years

Research Interest

- Machine Learning and Predictive Analytics
- Generative AI
- Spatial Data Analysis
- Computer Vision and Image Processing

Research Experiences

Hosseini, D. (2024). Investigating the use of graph neural network in recommender systems.(supervised by Dr.Sajedi) **In-progress**

University of Tehran, Faculty of Science, Department of Mathematics, Statistics, and Computer Science.

- This project focuses on using Graph Neural Networks (GNNs) to improve social recommender systems by modeling the impact of social influences. The goal is to enhance the accuracy and efficiency of these systems, providing better insights into user behavior and social interactions, ultimately improving user experience on social and commercial platforms.

Hosseini, D., & Amini, A. (2024). Investigating the dynamics of three neuron models: LIF, ELIF, and AELIF [Unpublished research project] (Supervised by Dr. G. Rokni Lamouki) **2024**

University of Tehran, Faculty of Science, Department of Mathematics, Statistics, and Computer Science.

- Examined neuron dynamics and their simulation in discrete time, focusing on three models: Leaky Integrate-and-Fire (LIF), Exponential Leaky Integrate-and-Fire (ELIF), and Adaptive Exponential Leaky Integrate-and-Fire (AELIF).
- Findings highlighted the applicability of each model and the largest acceptable time step in simulation.

Selected Projects

Dimensionality Reduction Classification and Clustering Techniques CODE

- **Technologies:** *Python, Scikit-learn, Pandas*
- This project applies Principal Component Analysis (PCA) for facial recognition and utilizes various clustering algorithms—**K-Means, Fuzzy C-Means, and DBSCAN**—to analyze different datasets.

Segmentation on Kvasir-SEG CODE

- **Technologies:** *Python, PyTorch, Scikit-learn, Numpy*
- Developed a deep learning **U-Net** model using **Kvasir-SEG** dataset for automatic polyp detection. Achieved high accuracy and performance metrics, enabling early cancer screening. Optimized hyperparameters and used data augmentation for better clinical practices.

Grapevine Leaf Classification Using Pre-trained Deep Learning Models CODE

- **Technologies:** *Python, Keras, Numpy, tensorflow, Seaborn, Shutil*
- This project presents the classification of grapevine leaves into distinct categories using deep learning models. The goal is to develop a machine learning model that accurately identifies various types of grapevine leaves, which can significantly benefit applications like viticulture, disease detection, and yield prediction in agriculture.

The Pacman Game with Q-Learning CODE

- **Technologies:** *Python, Numpy*
- This project solves the Pacman game using **Q-Learning**. The environment consists of agents, dots, walls, and optional ghosts (adding ghosts will provide bonus points). To discretize and digitize the paths, we convert them into small unit squares. The starting point of the agent's movement is also predetermined. The goal is to collect all the dots in the environment without encountering any ghosts (the agent cannot pass through walls).

Tic Tac Toe Game Server and Client CODE

- **Technologies:** *Python, Socket, Numpy, Pygame*
- This project implements a Tic Tac Toe game using Python, allowing two players to connect and play over a network. The project includes both server and client-side code, with functions for handling player connections, managing game logic, and rendering the game board using Pygame for the client.

Spiking Neural Network Architecture and Image Processing CODE

- **Technologies:** *Python, PyTorch, CoNeX*
- This project focuses on developing a spiking neural network (SNN) architecture that incorporates image processing techniques for enhanced feature extraction and learning, simulating aspects of biological vision.

Dynamics of Learning in Spiking Neural Networks CODE

- **Technologies:** *Python, PyTorch, CoNeX*
- This project investigates neuron structures within a single layer of a spiking neural network (SNN) and their impact on learning processes. It aims to explore how different structures influence learning outcomes..

Image Processing with Assembly CODE

- **Technologies:** *Assembly(x86 Nasm), Python*
- This project implements an Image Processor using assembly language, designed to process images through various transformations. The workflow involves converting an input image into a matrix using Python, saving that matrix in a text file, processing the matrix in assembly, and then displaying the final image, which is also saved in a text file.

Relevant Coursework

University Courses:

- Data Mining
- Database Management Systems
- Advanced Information Retrieval
- Artificial Intelligence
- Linear Algebra
- Graph Theory and Applications
- Statistical Methods
- Theory of Computation
- Data Structures and Algorithms
- Design and Analysis of Algorithms
- Introduction to Bioinformatics

Online Certificates From Coursera:

Structuring Machine Learning Projects
DeepLearning.AI, October 4, 2023

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
DeepLearning.AI, September 23, 2023

Neural Networks and Deep Learning
DeepLearning.AI, August 25, 2023

Honors and Awards

Full Scholarship, University of Tehran **Aug 2020**

Awarded for ranking in the top 1% of the national university entrance exam, achieving a full scholarship for a four-year Bachelor's degree in Computer Science

Skills

Languages: Python, C, C++, PHP, SQL, JavaScript, HTML, CSS
Frame Works: Scikit-learn, TensorFlow, Keras, PyTorch, CoNeX, OpenCV, Django, Laravel, NodeJS, Vue.js, React.js, Next.js, Typescript
Tools: GIT, MongoDB, MySQL, Redis, Linux, Photoshop, Pixelmator, Figma
Soft Skills: Leadership, Team Working, Time Management

Language

English: Fluent

Persian: Native

References

Name: Hedieh Sajedi
Title: Associate Professor of Computer Science
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Name: Gholam Reza Rokni Lamouki
Title: Associate Professor of Computer Science
Contact: rokni@ut.ac.ir