Mohammad Zafari

mhdzafari80@gmail.com | GitHub | Portfolio | Tehran, Iran

Education

Kharazmi University — Tehran, Iran
B.Sc. in Computer Science; ***GPA: 3.9/4.0*** — *Sep 2019 – Jun 2024*
Ranked **3rd** *in class of 40*

Experience

Kharazmi University — Tehran, Iran
Research Assistant — *Feb 2023 – July 2023*

- Developed knowledge distillation framework for image classification using PyTorch, inspired by recent advances in attention-based feature matching, improving student performance on the Stanford40 and CIFAR100 datasets,which uses an attention mechanism to identify effective feature pairs for distillation.This project was under the supervision of Prof. Mohammad Soltanian.

Kharazmi University — Tehran, Iran
Teaching Assistant — *Feb 2022 – May 2022*

- Conducted recitation sessions and actively monitored student progress to identify challenging topics in **Theory of Computation**(Automata Theory) under the supervision of Dr. Arash Ahadi.

Kharazmi University — Tehran, Iran
Teaching Assistant — *Sep 2021 – Dec 2021*

- Graded assignments and exams, provided academic support by answering student questions and explaining course material in **Introduction to Probability** under the supervision of Prof. Meisam Moghimbeygi.

Selected Projects

Knowledge Distillation For Image Classification | *GitHub*

- As part of the Senior Project in CS, I developed various knowledge distillation networks and adapted them to suit my specific objectives. I applied attention-based feature distillation techniques to two image classification datasets: Stanford40 and CIFAR100. To ensure efficient data handling, I implemented custom data loaders. I trained different combinations of teacher and student models—such as ResNet-34 to ResNet-18 and WideResNet-40-2 to WideResNet-16-2—using knowledge distillation. The main goal was to enhance the performance of the student models while maintaining their compact size.This project is Implemented in **PyTorch**.

Clustering Algorithms Comparison | *GitHub*

- As part of the ATCS project, I compared three clustering algorithms: K-Means, Agglomerative Clustering, and DBSCAN. These models were applied to three synthetic datasets: noisy circles, noisy moons, and isotropic Gaussian blobs, which evaluate their performance on different types of data. I visualized the clustering results and assessed model performance using several evaluation metrics, including the Rand Index, Jaccard Index, Silhouette Score, and Dunn Index. This project enhanced my understanding of unsupervised learning techniques and provided practical experience in clustering and model evaluation. This project is Implemented using the **Scikit-Learn** library.

Digit Recognition With MNIST Dataset | *GitHub*

- As part of ATCS project, I implemented multilayer perceptron (MLP) models with three fully connected layers, using a variety of activation functions including ReLU, SELU, ELU, and Tanh. The networks were trained with multiple optimizers such as SGD, Adam, RMSprop, AdamW, Adadelta, Adagrad, Adamax, Adafactor, Nadam, and FTRL. Implementations were done in both **Scikit-Learn** and **TensorFlow** to compare the behavior and performance between the two libraries.

Compare Optimization Algorithms | *GitHub*

- As part of the Nonlinear Programming project, I implemented and compared optimization algorithms—specifically Gradient Descent and Newton's Method—on multivariable nonlinear functions using **Python**. This project involved computing gradients and Hessians, analyzing convergence behavior, and visualizing optimization paths to explore how different initial conditions and step sizes affect results.

Implementing a Hotel Chain Database | *GitHub*

- As part of the Database Systems project, I Designed and implemented a relational database system for hotel chain management using **SQL**. The schema included 15 interrelated tables covering branches, rooms, customers, bookings, and staff. I wrote SQL queries for data retrieval, applied normalization to reduce redundancy, and enforced data integrity using primary and foreign keys.

Candy Store Simulation | *GitHub*

- As part of the Computer Simulation project, I used the SimPy discrete-event simulation library in **Python** to model the operation of a candy store. The simulation included customers arriving at random normal distribution intervals, waiting in queues, being served by multiple cashiers, and tracking key performance metrics such as average wait times and queue lengths. Furthermore, a second candy store scenario included high-priority customers who were served immediately upon arrival.

15-Puzzle Solver | *GitHub*

- As part of the Computer Simulation project, which solves and visualizes the 15-puzzle problem using search algorithms such as DFS, Hill-Climbing and A*, to explore various solution strategies. I have implemented Hill-Climbing and A*, while the visualization component was developed by my teammate. This project is Implemented by **Python**.

Hamilton Night's Tour Solver | *GitHub*

- As part of the project for Advanced Programming course, I developed a **Java**-based solution to the classic Knight's Tour problem, where the objective is to move a knight on a chessboard such that it visits every square exactly once. The implementation utilizes Warnsdorff's Rule—which selects the next move based on the square with the fewest onward moves—to efficiently find a valid tour. The algorithm dynamically calculates the accessibility of each square and selects the optimal path to minimize backtracking.

SPSS Project | *Report*

- As part of the Statistic I project, I analyzed statistical parameters in an SPSS dataset, which shows the amount of aflatoxin in 8 types of food. The analysis involved calculating descriptive statistics—such as mean, mode, median, and standard deviation—for each type of food. Additionally, I generated frequency distribution tables and assessed indices of central tendency and dispersion to understand the variability and distribution patterns of aflatoxin levels within each food category.

Standard Exams

TOEFL iBT Overal: **91/120** Attempted 2025

Reading: 21/30 Listening: 23/30 Speaking:22/30 Writing: 25/30

Skills

Languages: C, Java, Python, SQL, MATLAB, Assembly

Frameworks: PyTorch, TensorFlow, Scikit-learn, OpenCV

Certificates

Supervised Machine Learning: Regression and Classification| *Coursera*

Task-Oriented Course In Fundamentals Of Python Programming & Algorithmic Thinking| *Quera*

Relevant Coursework

Course	Grade	Course	Grade
Calculus I	A^+	Programming Fundamentals	A^-
Calculus II	B^+	Advanced Programming	A^-
Calculus III	A^+	Data Structures and Algorithms	B^+
Intro. to Probability	A^+	Algorithm Design and Analysis	A^+
Probability and Statistics I	A^+	Nonlinear Programming	A^+
Graph Theory	A^+	AI Fundamentals	A^+
Abstract Algebra	B^+	Simulation and Modeling	A^+
Intro. to Mathematical Sciences	B^+	Senior Project in Computer Science	A^+
Mathematical Logic and Set Theory	A^+	Theory of Computation	A^+
Combinatorics	A^+	Computer Systems Fundamentals	A^+
Linear Algebra or Matrix Theory	A^+	Computer Organization and Architecture	A
Numerical Methods for Linear Algebra	A^-	Database Systems	A^+
Numerical Analysis or Numerical Methods	A^-	Advanced Topics in Computer Science(ATCS)	A^+
Intro. to Mathematical Analysis	A^+	Networking and Data Communication	A^+
Differential Equations	A^-	Numerical Computing	A^+
Digital Logic Design	A^-	Compiler Design	A^+

References

Mohammad Soltanian, *Associate Professor*
Department of Computer Science,
Kharazmi University

Arash Ahadi, *Associate Professor*
Department of Computer Science & Mathematics,
Kharazmi University

Meisam Moghimbeygi, *Assistant Professor*
Department of Mathematics,
Kharazmi University

Keivan Borna, *Assistant Professor*
Department of Computer Science,
Kharazmi University