Samin Mahdipour

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Education

- **Amirkabir University of Technology** — Tehran, Iran
  Bachelor of Engineering — *Sep 2019 - Current*
  - **Computer Engineering**: Top student, GPA: 3.89 / 4.00 (U.S. grading system)
  - **Material Science and Metallurgy Engineering**: Rank No. 1 - 64 units passed, GPA: 4.0 / 4.0 (U.S. grading system)
- **Farzanegan 2 High School (National Organization for Development of Exceptional Talents)** — Tehran, Iran
  Diploma of Mathematics, Grade: 18.7 — *Class of 2018*

Research Interests

Natural Language Processing:
- Large Language Models (LLMs)
- Chatbot Development
- Dialogue State Tracking
- In-context Learning

Cognitive Studies in Computing:
- Cognitive Study and Analysis of LLMs
- Psychological study of LLM behaviors

Artificial Intelligence:
- Machine Learning
- Deep Learning
- Reinforcement Learning

Skills Summary

- **Languages:**
  - Python, Java, TSQL, Javascript, CSS
  - C/C++, SQL, Kotlin, HTML, Assembly
- **Python Libraries:**
  - NumPy, Pandas, Re, CoreNLP, OpenCV
  - Matplotlib, Scikit-learn, NLTK, Gensim, SciPy
  - Seaborn, Hazm, spaCy, Torch, Pickle
- **Tools:**
  - VSCode, Keras, Docker, Linux/bash, Github
  - Pycharm, Colab, Minikube, SQL Server, GitLab
  - IntelliJ, PyTorch, Apache Hadoop, MySQL
  - JupyterLab, Tensorflow, Ubuntu, PostgreSQL, Android-Studio

Work Experience

- **Research Assistant — Natural Language Processing Lab at AUT** — Aug 2023 - Current
  - **PI**: Dr. Saeedeh Momtazi
  - **Achievement**: Contributed to chit-chat system development at Amirkabir University's NLP Lab.
- **Research Intern — MABNA Intelligent Computing** — July 2023 - Aug 2023
  - **PI**: Dr. Saeedeh Momtazi
  - **Achievement**: Gained hands-on experience in text classification, sentiment analysis, and conversational AI systems, while collaborating with experts in the field to stay updated on the latest NLP trends and techniques, working closely with Amirkabir University of Technology's NLP Group.
- **Research Intern — Institute for Research in Fundamental Sciences (IPM)** — July 2022 - Aug 2022
  - **Role**: Machine Learning Intern
  - **Achievement**: Studying basics of machine learning, supervised and unsupervised learning, learning how to work on datasets, and working on some projects in supervised, unsupervised, and deep learning.
- **Teaching Assistant — Department of Computer Engineering at AUT** — Aug 2021 - Current
  - **Applied Linear Algebra**:
    - **Supervisor**: Dr. Ehsan Nazerfard
    - **Role**: Question Designer
    - **Significance**: Applied Linear Algebra in computer engineering uses mathematical concepts to solve real-world computer systems, data analysis, and optimization problems, enhancing data manipulation and analysis efficiency.

- **Advanced Programming**:
  - **Supervisor**: Dr. Roostayi
  - **Role**: Question and Project Designer
  - **Significance**: Advanced Programming is a course teaching Java programming language to students, It also focuses on the fundamentals of Object Oriented Programming (OOP).
- **Computer Networks**:
  - **Supervisor**: Dr. Sabaei
  - **Role**: Question Designer
  - **Significance**: Computer Networks course covers essential topics such as network architecture, protocols, security, and troubleshooting. Developed proficiency in network design and configuration, acquiring valuable skills for managing and optimizing computer network efficiency.
- **Microprocessors and assembly language**:
  - **Supervisor**: Dr. Farbeh
  - **Role**: Exam and Question Designer
  - **Significance**: Microprocessors and assembly language has been the most used methods of incorporating intelligence into automated devices. It is, therefore, necessary to develop a good understanding of their operation and how they can be used as building blocks for automated systems and control applications.

Academic Projects

- **Chatbot Dialogue State Tracking (Bachelor Thesis) - Summer 2024**: Proficient in Chatbot Dialogue State Tracking, a crucial aspect of chatbot development involving real-time user conversation monitoring, intent recognition, and context management for enhanced conversational AI interactions.
- **Chit-Chat Conversational System - Summer 2023**: Developed a kernel module to serve as The project's objective is to enhance chit-chat systems for customer interactions through advanced dataset collection methods like Multi Wizard-Of-Oz (MultiWOZ), ultimately improving chatbot performance.
- **Coin Price Monitoring Project - Spring 2023**: This project showcases a cloud computing course final project, creating a cryptocurrency price monitoring app with two services, "bepa" and "peyk." The project focuses on Docker, and Kubernetes deployment, and offers optional Docker Compose support. (code)
- **Job Execution Service - Spring 2023**: This project involves implementing an execution service to gain proficiency in cloud services. Users can upload files with Python, C, C++, Java, or other code for execution, with results delivered via email. (code)
- **Docker and Kubernetes Deployment - Spring 2023**: This project focuses on Docker and Kubernetes deployment, aiming to create a simple project and deploy it on a Kubernetes server. (code)
- **MapReduce on Hadoop Cluster - Spring 2023**: The goal of this project is to execute MapReduce on a Hadoop cluster. (code)
- **Neural Network Implementation - Spring 2023**: A neural network is implemented from scratch, incorporating various layers such as Fully Connected (FC), Conv2D, and Max Pooling. The implementation includes popular optimizers like Adam and Gradient Descent and loss functions including Binary Cross Entropy and Mean Squared Error. Different activation functions such as Sigmoid, ReLU, and Linear are also implemented. (code)
- **Fuzzy Car Controller - Spring 2023**: This project focuses on implementing a fuzzy car controller using charts. (code)
- **Super Mario Game - Spring 2023**: In this project a genetic algorithm is implemented to excel in the Super Mario game by evolving an optimal "goal chromosome" strategy. (code)
- **Persian Search Engine - Spring 2023**: This project is a Persian search engine developed as part of the Information Retrieval course. (code)
- **DFA, NFA, and Regular Expression Converters - Spring 2023**: This Project is divided into three parts: DFA Acceptor, NFA to DFA Converter, Regular Expression to NFA Converter. (code)
- **Turing Machine - Spring 2023**: The goal of this project was to create a Turing machine that can compute the factorial of (3n+1), where 'n' is a non-negative integer. (code)
- **URL Shortening System - Spring 2023**: The goal of this project was to design and implement a link-shortening system along with a dashboard for displaying statistics. (code)
- **Vehicle Factory - Spring 2023**: The goal of this project was to design a database for a vehicle factory that could store information about various aspects of the manufacturing process, including suppliers, parts, employees, and production. (code)
- **Pacman - Fall 2022**: In this project, a Pacman game is implemented using artificial intelligence algorithms based on CS221's projects at Stanford University. (code)
- **Food Delivery System - Fall 2022**: In this project a food delivery system was designed based on software engineering knowledge. (code)
- **Github User Finder - Fall 2022**: This project is a simple website that tries to show a user's data after getting his/her Git Id. (code)
- **Machine Learning Projects - Summer 2022 (code)**:
  - **Deep Learning**:
    - **Handwriting Detection**: The project utilized PCA for dimensionality reduction on a dataset containing handwritten numbers and employed SVM as the primary model to classify and recognize these numbers into their respective groups.

- **Supervised Learning**:
  - **Classification**:
    - **Ad Click Prediction**: This project involved analyzing a dataset of website advertisements to predict customer click-through rates using classification algorithms like SVM, Naive Bayes, and KNN.
    - **Heart Disease Health indicators**: The project utilized a dataset containing medical information about patients to predict their risk of experiencing a heart attack.
    - **Titanic Survivor Predictor**: This project worked on a dataset about Titanic ship passengers and tried to predict which passengers survived.
  - **Regression**:
    - **HDB Flat Prices Predictor**: In this project, using the dataset of different houses and their characteristics in the US states, we tried to estimate their approximate prices.
- **Unsupervised Learning**:
  - **Clustering**:
    - **Online Retail**: The project aimed to achieve optimal clustering of U.S. housing data using k-means, DBScan, and Mean Shift algorithms.

- **Lights Out Game Cheater - Spring 2022**: This project finds a cheat sheet for the Lights Out game based on linear algebra methods. (code)
- **XV6 Project - Spring 2022**: The project involves three phases: adding system calls to understand xv6's implementation, working with threads to distinguish them from processes, and implementing various CPU scheduling algorithms (RR, priority, multilevel queue, and lottery) in xv6. (code)
- **Chemical Equations Balancer - Spring 2022**: This project is a solution for balancing chemical equations based on linear algebra methods. (code)
- **Image Histogram and Shadow Generator - Spring 2022**: This project generates a histogram for input images and tries to generate a shadow for the main object. (code)
- **Bank Security - Spring 2022**: This project simulates a system that controls access to a bank's rooms. (code)
- **Message Broker - Spring 2022**: This project involves developing a Python-based message broker that acts as an intermediary, translating messages from the sender's formal messaging protocol to TCP, and facilitating communication between different systems. (code)
- **Twitter - Fall 2021**: This project is a JavaFX-based sample version of Twitter, featuring account creation, following functionality, account switching, and various social activities like commenting, liking, and retweeting, available in both Light and Dark Mode GUIs. (code)
- **Health Checking System - Spring 2021**: In this project, a health diagnosis system was designed using logic circuits course knowledge in Verilog. (code)
- **Mr.Jack Plus - Spring 2021**: This project tried to implement Mr. Jack, which was a game based on Sherlock Holmes adventures in C. (code)

Honors and Awards

- Passed in the first stage of the National Chemistry Olympiad - 2014, 2015, 2016 - (Certificate)
- Iranian Undergraduate Scholarship Full-ride funding coverage for studying B.Sc. in the high-ranking Amirkabir University of Technology, Government of Iran, 4 years.
- Ranked No.1 among Material Science and Metallurgy Engineering students in AUT
- Computer Engineering Top student with A+ GPA
- Admitted to the Exam High School under the Iranian National Organization for Development of Exceptional Talents (NODET) for high school studies

Courses

- Information Retrieval Course - GPA: 4.0 / 4.0 (U.S. grading system)
- Principles and Applications of Artificial Intelligence - GPA: 4.0 / 4.0 (U.S. grading system)
- Applied Linear Algebra Course - GPA: 4.0 / 4.0 (U.S. grading system)
- Discrete Mathematics Course - GPA: 4.0 / 4.0 (U.S. grading system)
- Advance Programming Course - GPA: 4.0 / 4.0 (U.S. grading system)
- Cloud Computing Course - GPA: 4.0 / 4.0 (U.S. grading system)

- Computer Networks Course - GPA: 4.0 / 4.0 (U.S. grading system)
- Introduction to Artificial Intelligence (AI) by IBM - (Certificate)
- Programming in Python by Meta - (Certificate)
- Introduction to Back-End Development by Meta - (Certificate)
- Introduction to Mobile Development by Meta - (Certificate)

Extracurricular Activities

- **Volunteer Columnist** 2020-2023
  Amirkabir University of Technology
  - **Columnist in Pouyesh Student Magazine**: The official publication of the student community of the Computer Engineering department.

Language Proficiencies

English Full Proficiency **Persian** Native **French** Beginner **Arabic** Beginner

References

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