SEYED MOHAMMAD HEJAZI HOSEINI

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RESEARCH INTERESTS

- Machine Learning
- AI Systems
- Software Engineering for AI
- AI for Software Engineering

EDUCATION

York University, Toronto, Canada
Master of Applied Science, Major
Department of Electrical Engineering & Computer Science
Jan. 2025 - In Progress

Amirkabir University of Technology, Tehran, Iran, GPA: 18.24/20 (3.89/4)
Bachelor of Science, Major
Department of Computer Engineering
Sept. 2018 - Jul. 2023

Shahid Ghoddusi High School (NODET), Qom, Iran, GPA: 18.65/20 (4/4)
Diploma of Mathematics and Physics
Sept. 2014 - Jul. 2018

TEACHING ASSISTANT

- **Fundamentals of Data Structures** *Winter 2025*
  Instructor: Prof. Ilir Dema
  Teaching tutorial classes
- **Data Structures for Data Science** *Winter 2025*
  Instructor: Prof. Chen-Wei (Jackie) Wang
  Grading tests and exam invigilation
- **Data Structures and Algorithms** *Spring 2022*
  Instructor: Prof. Alireza Bagheri and Sajad Shirali-Shahreza
  Grading and designing assignments along with class tests
- **Algorithm Design** *Spring 2022*
  Instructor: Prof. Alireza Bagheri
  Grading and designing assignments along with class tests

RESEARCH AND PRESENTATIONS

- **Building a Recommendation System Including User Specific Recommendation, Similar Items, and Cold Start** *Feb 2022 - Feb 2023*
  My bachelor thesis which includes the completed system running in Kubernetes and an elaborate paper describing the concepts and architecture of the system. Also, the code was made into a Python library called KabirRec which could be used to easily build a recommendation system from the ground up. Notably, the project was later used as a service in a much more extensive AI-as-a-service framework. GitHub PyPI
- **A Survey on Smart Power Grid** *Jul 2021 - Sep 2021*
  I had the chance to do an internship at Qom Province Electricity Distribution Company, Iran, for around three months. As a result, I wrote a paper that presents a survey on understanding the smart power grid and its various key components.
- **Machine Learning Applications for Data Caching in Wireless Network** *Feb 2021 - Jun 2021*
  As part of the Research and Technical Presentation course, I wrote a paper on machine learning techniques for caching data at edge network to reduce latency and energy consumption. Additionally, a corresponding presentation was prepared and given.

LANGUAGES

- **English**: Proficient in all four skills

  TOEFL iBT Score: 117 - Reading: 30, Listening: 30 Speaking: 29, Writing: 28

- **Persian**: Native

SELECTED PROJECTS

- **Neuroevolution in a Game** GitHub
  Using neuroevolution algorithm to optimize the weights and biases of an ANN, acting as an agent that controls the movements of the character in the game. Multiple selection algorithms, operators, and fitness functions were implemented.

- **Fuzzy Expert System for Heart Disease Diagnosis** GitHub
  Building a fuzzy control system including fuzzification, inference, and defuzzification stages. Several inputs like age, blood sugar, and cholesterol level are taken in, and then the patient is diagnosed based on a set of rules.

- **Multilayer Perceptron and Convolutional Neural Networks** GitHub
  Implementing MLP with stochastic gradient descent from scratch, to classify objects in CIFAR-10 data set. Additionally, to compare the results, a CNN using the TensorFlow library was programmed.

- **AI Agents in Pac-Man** GitHub
  Three different projects were done on the Pac-Man game. First, implementation of search algorithms like BFS, DFS, UCS, and A* along with various heuristics. Second, adhesive algorithms like Minimax and Expectiminimax. Third, Value Iteration and Q-Learning.

- **Parallelized Gennan Library With OpenMP** GitHub
  Gennan is a library for training and using feedforward artificial neural networks (ANN) in C, and it runs linearly. I used the OpenMP interface to Parallelize the library with multithreading techniques.

- **Data Mining on Twitter Data Set** GitHub
  By using Apache Hadoop Distributed File System and MapReduce method, a large Twitter data set was processed across clusters of computers to count the number of tweets that contain #Trump or #Biden and the percentages of these tweets in each country.

- **Online Book Store** GitHub
  Working as a member in a group of four people for about 4 months, designing and building an online book store. We went through every single stage of the scrum process which is an agile project management methodology.

- **Sorting Visualizer** GitHub Pages
  Visualizing sorting algorithms with an interactive web page, demonstrating the actions taken step by step.

- **URL Shortener in Kubernetes and Docker** GitHub
  An API server running on Kubernetes that shortens URLs and stores them in MongoDB database. There can be multiple servers running at the same time while being load balanced and able to scale on demand.

- **Twitter Clone API Server** GitHub
  A Twitter clone API server with an extensive back-end supporting all kinds of actions like twitting, following, blocking, and others. All the data were stored in a PostgreSQL database.

- **Postman Clone** GitHub
  Building an HTTP client app with many features including specifying request method, headers, and body. Response request shows status, headers, and body which can be saved. Also, you can preview response images.

- **Communication in IOT with MQTT and COAP Protocols** GitHub
  A simulation of a workplace consisting of personnel room nodes, local server, central server, and admins communicating through two popular network protocols in IOT.

- **DNS Protocol** GitHub
  Implementing both iterative and recursive DNS queries from scratch to retrieve information regarding a domain name from DNS servers.

- **XV6 OS Threads** GitHub
  Implementing threads and the ability of multithread programming in the XV6 operating system. XV6 is a modern reimplementation of sixth edition Unix in ANSI C, created at MIT for educational purposes.

SKILLS

- **Programming Languages**: Python, Java, C++, C, Assembly, VHDL, Verilog
- **Web Development**: JavaScript, PHP, HTML, CSS, NodeJS, ReactJS
- **Python Libraries**: Scikit-Learn, TensorFlow, NumPy, Pandas, Matplotlib, PyTourch
- **Tools**: GitHub, Docker, Kubernetes, OpenMP, CUDA, Wireshark, Hadoop Distributed File System
- **Database Systems**: MySQL, MongoDB, PostgreSQL, Redis
- **Engineering Software:**: Arduino, Proteus, Keil µVision, ModelSim, OrCAD Capture
- **Miscellaneous**: Linux OS, MS Office, Latex

HONORS AND AWARDS

- University Honor Student, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran, 2023
- Achieved top 0.8% place among all applicants of the Nationwide University Entrance Exam for B.Sc. in Mathematics and Engineering (Approximately 144000 applicants), Iran, 2018.
- Achieved top 3% place among all applicants of the Nationwide University Entrance Exam for B.Sc. in Foreign Languages - English (Approximately 145000 applicants), Iran, 2018.
- Educated in Iranian National Organization for Development of Exceptional Talents (NODET) during middle and high school, Qom, Iran, 2011 - 2018.
- Acquired an English certificate from Gooyesh Academy of Foreign Languages with an average score of 96/100, Iran, 2014

RELATED COURSES

- Principles & Applications of AI (18.6/20)
- Principles of Computational Intelligence (18/20)
- Theory of Machines and Languages (20/20)
- Algorithm Design (20/20)
- Data Structures and Algorithms (18.25/20)
- Operating Systems (19.37/20)
- Principles of Cloud Computing (18/20)
- Web Programming (20/20)
- Internet of Things (20/20)
- Fundamentals of Computer Programming (18.4/20)
- Research and Technical Presentation (18.3/20)
- Bachelor Thesis (19.75/20)