SEYED MOHAMMAD HEJAZI HOSEINI

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RESEARCH INTERESTS

- AI Reproducibility
- Software Engineering AI Agents
- 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 and Design and Analysis of Algorithms** *Winter 2025*
  Instructor: Prof. Jackie Wang
  Grader and Invigilator

- **Fundamentals of Data Structures** *Fall 2025*
  Instructor: Prof. Andriy Pavlovych
  Grader and Invigilator

- **Advanced Object Oriented Programming** *Summer 2025*
  Instructor: Prof. Jackie Wang
  Lab Demonstrator and Grader

- **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
  Exam grading and 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

- **LLM Reproducibility using Llama.cpp and vLLM** *Jan 2025 - Present*
  Building a Python library to make LLM-agent experiments reproducible and comparable across frameworks. It standardizes run metadata via adapters, generates deterministic run IDs/seeds, and adds OpenTelemetry-based recording of traces, logs, and artifacts for record/replay. Testing the workflow on OpenAI-compatible backends including llama.cpp and vLLM, and integrating evaluation tooling (e.g., RAGAS) to support systematic analysis of agent behavior, failures, and cost/token usage. GitHub

– **Error and Cost Analysis of Software Engineering Agents on SWE-bench** *Nov 2025 - Present*
Ongoing research project analyzing the computational cost and failure modes of SWE-bench Verified agents (SWE-agent, mini-SWE-agent, Moatless Tools, Nemotron-CORTEXA). Quantifying performance and cost metrics from official experiment logs (success rate, token usage, interaction depth; cost-per-success) and reviewing agent implementations to understand how budgeting and termination policies influence behavior. Prototyping early-run cost predictors to enable dynamic budgeting and cost-aware deployment.

– **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

– **Smart Power Grid Internship and Survey** *Jul 2021 - Sep 2021*
Completed a three-month internship at Qom Province Electricity Distribution Company, Iran. Explored data analytics and machine learning applications for electric power distribution, including forecasting, anomaly detection, and equipment health monitoring. Studied smart-grid infrastructure and modern utility technologies such as smart meters, advanced distribution systems, and grid-edge intelligence. Produced a technical survey on smart power grids, covering key components, challenges, and opportunities for intelligent decision-making.

– **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.

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

- Neural Networks and Deep Learning (A+)
- Data Analytics and Visualization (A)
- Principles & Applications of AI (18.6/20)
- Principles of Computational Intelligence (18/20)
- Algorithm Design (20/20)
- Data Structures and Algorithms (18.25/20)
- Bachelor Thesis (19.75/20)
- Web Programming (20/20)
- Theory of Machines and Languages (20/20)
- Operating Systems (19.37/20)
- Principles of Cloud Computing (18/20)
- Internet of Things (20/20)