Mahdiyar Ali Akbar Alavi

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Education

University of Tehran — *Tehran, Iran*

Bachelor of Science in Electrical Engineering — **September 2017 - July 2022**

- Overall GPA: **16.75/20 (3.52/4)**
- GPA of Last 2 Years: **17.75/20 (3.79/4)**

Minor in Computer Engineering — **September 2019 - February 2022**

- Overall GPA: **18.29/20 (3.8/4)**

National Organization for Development of Exceptional Talents — *Tehran, Iran*

Diploma in Mathematics and Physics Discipline — **September 2013 - June 2017**

- Overall GPA: **19.88/20 (4/4)**

Research Interests

- Applied Machine Learning
- Computer Vision
- Deep Learning
- Natural Language Processing
- Natural Language Understanding
- Human-Robot Interaction

Relevant Courses (Graduate courses are indicated by †)

- Artificial Intelligence | **Score:** 19.75/20
- Operational Research | **Score:** 18/20
- Discrete Mathematics | **Score:** 17.2/20
- Modern Control Systems | **Score:** 19.1/20
- Fundamentals of Mechatronics Engineering | **Score:** 16.5/20
- Neural Networks† | **Score:** 16/20
- Advanced Programming | **Score:** 19/20
- Operating Systems | **Score:** 17.1/20
- Advanced Algorithms | *Auditing*
- Linear Algebra | **Score:** 18.7/20
- Data Structures | **Score:** 20/20
- Computer Architecture | **Score:** 19.3/20
- Distributed Systems | *Auditing*

Research Experience and Notable Projects

- **B.Sc. Thesis:** *Robustifying Deep NLP Models against Bias using Dataset Cartography* — **February 2022 - July 2022**
  Supervisor: Dr. Yadollah Yaghoobzadeh

  Through Dataset Cartography, I fine-tuned RoBERTa-base and Bert-base-uncased models using various datasets in different ways. For example, first, I fine-tuned models with the whole dataset and then with its most ambiguous samples. Furthermore, I evaluated the models using evaluation sets, such as HANS and SuperGLUE Diagnostic Dataset. By employing this method, mnli-6-var33-3 was born (a fine-tuned RoBERTa-base model for MNLI, which reported an improvement of 2.53% in the evaluation process using HANS). Currently, I am working on a paper regarding this research.

- Gesture-controlled Robot using Arduino and Python (MediaPipe) — **November 2022**
  Supervisor: Dr. Mehdi Tale Masouleh

  I built a 4-wheel drive gesture-controlled mobile robot during the Arduino Instruction work experience at Robotech Academy. This robot was simply controllable with hand gestures through Arduino Uno and Python MediaPipe Computer Vision library. This project was designed to assess students of the introductory robotics tutorial course.

- Solving a Linear Programming Problem (Optimal Vehicle Routing) using Python (PuLP) — **February 2022**
  Course Title: Operational Research

  First, a dataset was collected through Google Maps, which included ten famous sites in Tehran. Then, inspired by the Network Flow Problem, I coded a Python script using Linear Programming to find the shortest path between two arbitrary given places in the dataset.

- An Instagram Bot (InstaCrawler) for Automatic Data Collection using Python (Selenium) — **September 2021**
  Supervisor: Dr. Reshad Hosseini

  During my internship at HARA AI, I developed a Python module using the Selenium library, which was able to log into the Instagram website, like new posts, visit unseen stories, and download pictures. Collected pictures could then be used to train deep learning models in the field of Computer Vision. This project's most challenging part was making the bot behave like ordinary users, as the Instagram website can easily detect unusual behaviors and ban automatic data collectors.

- Race Recognition using Artificial Neural Networks in Python (Keras) — **June 2021**
  Course Title: Artificial Intelligence

  In the first phase of this project, I analyzed the UTKFace dataset through the Pandas, Seaborn, and PyPlot libraries. Then, I prepared the data for the training process and trained an artificial neural network with the processed data using the Keras API. This model could predict each person's ethnicity by having their face image. Afterward, I tried to enhance the accuracy of predictions by changing different training parameters, such as the optimizer function or the kernel regularizer. In the last phase, I used the test data (30% of the dataset) to evaluate the model, which indicated an accuracy of 71%.

- House Price Prediction using Multithreading in C++ (PThread) **June 2021**
  Course Title: Operating Systems
- Multi-cycle Stack-based Processor Design in Verilog **May 2021**
  Course Title: Computer Architecture (Digital Systems II)
- Classification of Persian (Farsi) Books using Naïve Bayes Classifier in Python **May 2021**
  Course Title: Artificial Intelligence
- Image Restoration using Discrete Hopfield Network in Python **December 2020**
  Course Title: Neural Networks
- A Two-Player Computer Game (Soccer Stars) using Object-Oriented Programming in C++ **November 2020**
  Course Title: Advanced Programming
- Document Detection using MATLAB **August 2020**
  Course Title: Digital Signal Processing (DSP)
- Red-Black Tree Implementation using Python **July 2020**
  Course Title: Data Structures and Algorithms

Teaching Assistant Experience

- Fundamentals of Mechatronics Engineering | **Role:** Teaching Assistant **Spring 2022**
  Instructor: Dr. Mehdi Tale Masouleh
- Computer Architecture (Digital Systems II) | **Role:** Teaching Assistant **Spring 2022**
  Instructor: Dr. Saeed Safari
- Computer Architecture Laboratory | **Role:** Laboratory Assistant Instructor **Spring 2022**
  Instructor: Dr. Saeed Safari
- Modern Control Systems | **Role:** Teaching Assistant **Fall 2021**
  Instructor: Dr. Hamed Kebriaei
- Introduction to Computing Systems and Programming | **Role:** Supervising Teaching Assistant **Fall 2021**
  Instructors: Dr. Hadi Moradi and Dr. Mostafa Tavassolipour
- Electrical Measurement Laboratory I | **Role:** Laboratory Assistant Instructor **Fall 2018**
  Instructor: Dr. Hossein Iman-Eini

Work Experience

- **Robotech Academy** | **Role:** Part-time Arduino Instructor **June 2022 - Present**
  Description: We are preparing an introductory robotics tutorial course, and I undertake the Arduino instruction part.
- **Karyar College** | **Role:** Volunteer Front-end Development Teaching Assistant **August 2021 - October 2021**
  Description: I used to hold weekly Q&A sessions for students who were learning front-end development.
- **HARA AI** | **Role:** Part-time Summer Intern **July 2021 - August 2021**
  Description: I created a Python module (InstaCrawler) to automatically collect data from Instagram.

Honors and Awards

- Ranked 533rd among 148,000 contestants in National University Entrance Exam in the field of Mathematics and Physics **July 2017**

Licenses and Certificates

- *Natural Language Processing in Python Track* | **Presented by:** DataCamp | View Certificate **March 2022**
- *Intro to Machine Learning* | **Presented by:** Kaggle | View Certificate **September 2021**

Programming Skills

- Python (Selenium, PuLP, NumPy, Pandas, and Keras)
- C/C++ (Object-Oriented Programming)
- MATLAB
- Front-end Development (HTML/CSS/jQuery)
- Verilog HDL
- Arduino

Languages

- Persian (Farsi) | Native
- English | Advanced
  - IELTS Academic Band Score: 7.5 (L: 8.5, R: 8.0, S: 7.5, W: 6.5)
- French | Elementary

References

Available upon request.