

Mahdi Abbariki

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Education

Noshirvani University of Technology

BSc in Computer Engineering, GPA: 17.89/20, 3.69/4

- **Thesis Title:** Machine Learning Models for Visual Imagery Detection in the Brain Using EEG Signals

Babol, Iran
2019 – 2023

Shahed high school

Diploma in Mathematics and Physics, GPA: 18.58/20

Sabzevar, Iran
2016 - 2019

Research Interests

- Machine Learning & Deep Learning
- Computer Vision
- Human-Computer Interaction
- Medical Image Analysis
- Intelligent Systems & Robotics
- Federated Learning

Publications

- **Abbariki, M., & Shoman, M. (2025).** Interpreting the Unexpected: A Multimodal Framework for Out-of-Label Hazard Detection and Explanation in Autonomous Driving. In Proceedings of the Winter Conference on Applications of Computer Vision (WACV), pp. 669–676. [Link](#) [🔗](#).

Research Experiences

Machine Learning Models for Visual Imagery Detection in the Brain Using EEG Signals BSc Thesis, 2023

- Developed multiple machine learning models (SVM, Random Forest, Naive Bayes, and Decision Tree) and a deep learning model (CNN) using **Python** and relevant packages (**TensorFlow, NumPy, Pandas, Matplotlib**).
- Classified visual imagery from **EEG signals** of the human brain using the [Visual Imagery of Geometric Shapes dataset](#) [🔗](#).
- Implemented **Select K-Best** feature extraction based on **ANOVA** (Analysis of Variance).
- Achieved **85.72%** accuracy with the SVM model, improving the accuracy of [previous research](#) [🔗](#).

Precision agriculture based on AI 2022

- Developed an AI to classify pests using images provided by farmers and collected by the team, utilizing **Python** and relevant packages (**Scikit-learn**).
- Designed and developed a website with multiple panels displaying different parameters of land on a map, such as **NDVI, SAVI, and TDVI**, using **satellite** images.

Honors & Awards

Ranked 3rd out of 73 in the bachelor's class of 2023. 2023

Nominated for the **University-Wide Best Thesis** Contest across all departments. 2023

Ranked 1st in the bachelor's class for the Fall 2022 semester. 2022

Ranked within the **top 10%** in the Iranian University Entrance Exam for bachelor's study among more than 164,000 participants. 2019

Projects

Line and Face Detection using Morphological Operations — Python, OpenCV, Matplotlib 2023

- Detected lines of text in several images of different Persian books using **OpenCV** and morphological processes.
- Detected faces in various images containing groups of people using **OpenCV, NumPy**, and morphological processes.

Digits Recognition — Python, Scikit-learn, Matplotlib 2023

- Developed an **MLP Classifier** to recognize digits from 0 to 9 in an input image using **Scikit-learn**.
- Used the [Optical Recognition of Handwritten Digits dataset](#) [🔗](#).

Chess-Playing AI using Monte Carlo Tree Search — Tree Search concepts, JavaScript [Repo](#) [🔗](#) 2022

- Developed an AI based on the MCTS technique from scratch, without using any third-party packages, using **JavaScript**.
- Tuned parameters to balance attacking and defending in the game to achieve the best results by predicting available moves.

Entropy-Based Feature Selection for Grade Prediction — Python, Pandas, NumPy, Matplotlib 2022

- Selected the best features to predict student grades based on entropy from 33 different features.

Languages and Test Scores

English: Proficient **IELTS Overall: 8.0** (Reading: 9, Listening: 9, Speaking: 7.0, Writing: 7.0), Test Date: Sep, 2024
Persian: Native

Teaching Experiences

- Teaching Assistant for **Data Structures** Spring 2023
- **Graded** final project and assignments, **held office hours**, and **provided feedback**.
- Teaching Assistant for **Fundamentals and Applications of Artificial intelligence** Fall 2022
- Offered **additional study sessions**, **graded** final project and assignments, and **provided feedback**.
- Teaching Assistant for **Operating Systems** Spring 2022
- **Graded** final project and assignments, and **provided feedback**.
- Teaching Assistant for **Principles of Database Design** Fall 2021
- Offered **additional study sessions**, **graded** final project and assignments, and **provided feedback**.
- Teaching Assistant for **Web and Mobile Development** Spring 2021
- Offered **additional study sessions**, **graded** final project and assignments, and **provided feedback**.

Selected Courses

- Fundamental of Data Mining**, Grade: 19.8/20 Spring 2023
- Fundamentals of Computer Vision**, Grade: 18.75/20 Spring 2023
- Fundamentals of Computational intelligence**, Grade: 19.25/20 Fall 2022
- Fundamentals and Applications of Artificial intelligence**, Grade: 19.9/20 Spring 2022
- Applied Linear Algebra**, Grade: 19.75/20 Fall 2021
- Operating systems**, Grade: 18.6/20 Fall 2021
- The Theory of Formal Language and Automata**, Grade: 20/20 Spring 2021
- Principles of Database Design**, Grade: 19.3/20 Spring 2021

Work Experiences

- Senior Back-End Developer (Part-time)**, Novanex, Sabzevar, Iran 2023 - 2025
- **Startup Co-Founder, shareholder, and back-end developer** for VanaFood, an online food marketplace, developing API endpoints for various panels using Laravel.
 - Enhanced **leadership and collaboration skills** through managing technical development and stakeholder coordination in a startup environment.
- Senior Back-End Developer (Part-time)**, Peyvandtel Co., Tehran, Iran 2020 - 2025
- Developing a CRM based on **Laravel/PHP**, along with a **Node.js** socket server.
 - Designing databases using **MySQL & MongoDB**, optimizing it for **big data** analytics.
 - Gained valuable **problem-solving** skills through hands-on development and system management.
- Mid-Level Back-End Developer**, Novanex, Sabzevar, Iran 2019 - 2020
- Developed websites, panels, and CRMs using **Laravel**, providing custom solutions tailored to diverse client needs.
- Web Developer Intern**, Heyzha Co., Sabzevar, Iran 2017 - 2018
- Contributed to building websites, panels, and CRMs using **PHP** for various clients, gaining **practical experience** in web development and **teamwork**.

Technical Skills

Languages: Python, PHP, Java, C++, SQL, JavaScript, HTML5, CSS3, L^AT_EX

Python Packages: Scikit-learn, TensorFlow, NumPy, Pandas, Matplotlib, OpenCV, YOLO, DPT-DINOv2, RAFT, Blip2

Databases: MySQL, PostgreSQL, Redis, MongoDB

IDEs/Tools: Weka, VS Code, Jupyter, PyCharm, PhpStorm, Git, Docker, Linux, Figma, Swagger, Postman

References

Available upon request.