

Parsa Mohammadi | Curriculum Vitae

☎ (+98) 9182265891

🌐 [Personal Website](#)

✉ parsamohammadi@aut.ac.ir

🐙 [GitHub](#)

🌐 [LinkedIn](#)

🔍 [Google Scholar](#)

EDUCATION

- **Amirkabir University of Technology (AUT)**, Tehran, Iran Sep 2020 – Present
 - B.S. in Electrical Engineering
 - **GPA: 3.56 (17.42 out of 20)**, Last 2 years: **3.88 (18.1 out of 20)**.
 - Ranked within the top 1% of the Iranian University Entrance exam.

RESEARCH INTERESTS

- Natural Language Processing (NLP)
- Large Language Models (LLM)
- Computer Vision
- AI for Healthcare

PUBLICATIONS

- **Mohammadi, P.**, Sharifian, S., *Med Mini-Gemini: Chest X-ray Images Diagnosis and Report Generation. Underpreparation.*
- **Mohammadi, P.**, Malakouti, M., Suratgar, A., Menhaj, M. *Eye Pupil Control Analysis.* Vision Research Journal (Under Review) (<https://doi.org/10.21203/rs.3.rs-4504934/v1>)

RESEARCH EXPERIENCES

- **Medical Images Report Generation - HPCRC Lab** Jan 2024
 - Fine-tuned **COCA Vision-Language** Model achieving **80%** accuracy on the **MIMIC-CXR** dataset.
 - Applied a fine-tuned **BERT** model, achieving an **81%** accuracy rate on the **MIMIC-III** dataset.
 - Supervisor: Dr. Saeed Sharifian (Amirkabir University of Technology, Tehran, Iran)
- **Tondguyan Petrochemical Company Maintenance System** Jul 2023 – Sep 2023
 - Performed feature reduction on a dataset of mechanical properties of facilities.
 - Implemented the K-means algorithm to identify anomalous data clusters.
 - Supervisor: Dr. Somaye Mohammadi (Sharif University of Technology, Tehran, Iran)
- **Eye Pupil Control Analysis – DIOR Lab** Oct 2022 – Mar 2023
 - Linearized a complex, non-linear model of human eye pupil control to facilitate further analysis.
 - Conducted linear control analysis on the linearized model.
 - Supervisor: Dr. AmirAbolfazl Suratgar (Amirkabir University of Technology, Tehran, Iran)
- **Data-driven Maintenance of Urban Infrastructure in Smart City** Dec 2021 – Jul 2022
 - Utilized Random Forest, K-means algorithms and MLP to optimize the cost of maintenance and repair of power networks. Achieved **90% accuracy** for predicting power network failures.
 - Developed a Decision Support web application for control centers using Django framework.

WORK EXPERIENCES

- **Machine Learning Intern - [Asr Gooyesh Pardaz](#)** · Full-time, Tehran, Iran Jul 2023 – Sep 2023
 - Trained an end-to-end Automatic Speech Recognition (ASR) model using **E-Branchformer** architecture and **ESPNet framework** on a Persian dataset.
 - Achieved **2.0 WER** on Mozilla's Common Voice dataset (Persian).
 - Implemented the trained model on **Hugging Face Space** with **Gradio**, providing an interactive user interface. Link to [online demo](#).
 - Supervisor: Dr. Hossien Sameti (Sharif University of Technology, Tehran, Iran)

TEACHING EXPERIENCES

Amirkabir University of Technology (AUT), Tehran, Iran

- **Logical Circuits** Sep 2024 – Present
 - Taught MATLAB and Simulink basics to students.
 - Supervisor: Dr. Zahra Shariatmadar (Amirkabir University of Technology, Tehran, Iran)
- **Computer Architecture & Microprocessors** Sep 2023 – Feb 2024
 - Created educational materials, including projects and weekly homework.
 - Supervisor: Dr. Ahad Shabani (Amirkabir University of Technology, Tehran, Iran)
- **Linear Control Systems - Electrical Engineering** Feb 2023 – Jul 2023
 - Taught VHDL programing with Vivado and ISE.
 - Supervisor: Dr. Amir A. Suratgar (Amirkabir University of Technology, Tehran, Iran)

Sharif University of Technology (SUT), Tehran, Iran

Sep 2023 – Present

- **Automatic Speech Recognition – For the past three semesters**
 - Conducted weekly quizzes and workshops on **ESPNet** framework.
 - Supervisor: Dr. Hossien Sameti (Sharif University of Technology, Tehran, Iran)

SKILLS

Programming Skills	Machine Learning Skills	Others
Python <ul style="list-style-type: none">- TensorFlow- PyTorch- NumPy- Pandas- Sklearn- Gradio- OpenCV- Threading C/C++HTML/CSSJavaScriptMatlab	NLP <ul style="list-style-type: none">- NER- Semantic Analysis- Vision-Language- LLM- NLTK Speech Processing <ul style="list-style-type: none">- ASR- ESPNet Computer Vision <ul style="list-style-type: none">- Segmentation- Object detection Classical AI Algorithms	LinuxGitDockerJupyter NotebookVSCodeLaTeX

SELECTED PROJECTS

Bachelor thesis: Chest X-ray Images Diagnosis and Report Generation

Mar 2024 – Present

- Tuned **Mini-Gemini** (Pre-trained VLM) on a large dataset of radiology images for **VQA** task.
- Created a **new dataset** of paired images and reports for training.
- Achieved significant performance improvements on the test set.
- Supervisor: Dr. Saeed Sharifian (Amirkabir University of Technology, Tehran, Iran)

Radiology Image Diagnosis

Feb 2024 – Mar 2024

- Trained **COCA Vision-Language Model** on the U-Xray dataset to diagnose TB and pneumonia from chest X-ray images, achieving **84.6%** accuracy.
- Implemented Low-Rank Adaptation (**LoRA**) to optimize memory usage during model training.
- Conducted comparative evaluation using **Gemini 1.5 Pro** API to verify results against ground truth data.
- Supervisor: Dr. Saeed Sharifian (Amirkabir University of Technology, Tehran, Iran)

Cancer detection with chest X-ray CT images

Feb 2024 – Mar 2024

- Fine-tuned YOLOv8 on the Lung-PET-CT-Dx dataset for cancer detection, achieving 79% accuracy on the test set.
- Supervisor: Dr. Saeed Sharifian (Amirkabir University of Technology, Tehran, Iran)

Sentiment Analysis of Twitter Posts

Sep 2023 – Feb 2024

- Preprocessed a large dataset of Twitter posts, including tokenization, stemming, and normalization, for sentiment analysis.
- Employed **TF-IDF** for feature extraction and fine-tuned a **BERT-based uncased** model, achieving 95% accuracy on the test set.

Gender Classifier Model Development

Jul 2023 – Sep 2023

- Trained a MobileNet architecture model using **Keras** and **TensorFlow** on a merged dataset from five large image datasets with gender labels.
- Achieved **92.7%** accuracy on the test set and deployed the model on a personal website using Django. Link to [project](#).

Correlation Algorithms Survey

May 2022 – Aug 2022

- Conducted an in-depth analysis of four **correlation algorithms**: Pearson, Spearman, Chatterjee, and MIC.
- Developed and released open-source code, providing easy-to-use implementations for researchers. Link to [project](#).

COURSES

- | | | | |
|---------------------------|-------------|------------------------|---------------|
| • Artificial Intelligence | [Fall 2021] | • Advanced Programming | [Winter 2023] |
| • Machine Learning | [Fall 2023] | • Computer Vision | [Winter 2024] |

➤ Online Certificated Courses:

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| • Machine Learning
- <i>Dr. Andrew Ng</i> | • Deep Learning Specialization
▪ Convolutional Neural Networks
▪ Sequence Models (Transformers)
- <i>Dr. Andrew Ng</i> |
| • Django for Everybody
- <i>Dr. Charles Severance</i> | • Finetuning Large Language Models
- <i>Deeplearning.ai</i> |
| • Analysis of Intelligent Biomedical Images
- <i>Dr. Mohammad H, Rohban</i> | • Prompt Engineering with Llama 2 & 3
- <i>Deeplearning.ai</i> |
| • Building and Evaluating Advanced RAG Applications
- <i>Deeplearning.ai</i> | • Prompt Engineering for Vision Models
- <i>Deeplearning.ai</i> |

VOLUNTEERING EXPERIENCES

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|---|----------------|
| • Participated in a charity market
▪ Created and sold handmade goods to raise funds supporting underprivileged students. | Feb 2024 |
| • Member of Amirkabir Astronomy Club
▪ Designed and implemented astronomical events, engaging students and the public in astronomy-related activities. | Apr 2023 |
| • Member of “Amirkabir 2021 International Summer School,” Executive Team
• Invited Dr. Larry Cheng from Penn State University to participate in the summer school.
• Assisted Dr. Larry Cheng during the summer school sessions. | Mar – Sep 2021 |

Honors

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| • Won 1st place prize in the IEEE Open Data Hackathon Competition. Certificate link | Nov 2022 |
| • Ranked among top teams in Irancell Labs AI Hackathon. Certificate link . | Aug 2023 |

LANGUAGE PROFICIENCY

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| • English (Exam date: 10/31/2024) | • Persian (Native) | • Kurdish (Native) |
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