

# Parsa Mohammadi | Curriculum Vitae

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## 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.**, 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.
- Supervisor: Dr. Alireza Fereidunian (K. N. Toosi University of Technology, Tehran, Iran)

## 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

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

- Machine Learning
    - Dr. Andrew Ng
  - Django for Everybody
    - Dr. Charles Severance
  - Analysis of Intelligent Biomedical Images
    - Dr. Mohammad H, Rohban
  - Building and Evaluating Advanced RAG Applications
    - Deeplearning.ai

- Deep Learning Specialization
    - Convolutional Neural Networks
    - Sequence Models (Transformers)
    - Dr. Andrew Ng
  - Finetuning Large Language Models
    - Deeplearning.ai
  - Prompt Engineering with Llama 2 & 3
    - Deeplearning.ai
  - Prompt Engineering for Vision Models
    - Deeplearning.ai

## VOLUNTEERING EXPERIENCES

- Participated in a charity market

Feb 2024

  - Created and sold handmade goods to raise funds supporting underprivileged students.
- Member of Amirkabir Astronomy Club

Apr 2023

  - Designed and implemented astronomical events, engaging students and the public in astronomy-related activities.
- Member of “Amirkabir 2021 International Summer School,” Executive Team

Mar – Sep 2021

  - Invited Dr. Larry Cheng from Penn State University to participate in the summer school.
  - Assisted Dr. Larry Cheng during the summer school sessions.

## Honors

- 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

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