

Parsa Mohammadi | Curriculum Vitae

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EDUCATION

- **Amirkabir University of Technology (AUT)**, Tehran, Iran Sep 2020 – Present
 - B.S. in Electrical Engineering - Electronics
 - **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

- Machine Learning
- Computer Vision
- FPGA
- Microprocessor

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)*
- **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)*
- **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)*

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 **ESPN** 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

- **Microprocessor Systems & Interfaces** Sep 2024 – Present
 - Taught embedded C, assembly and microprocessor basics.
 - Supervisor: Dr. Amir A. Suratgar (Amirkabir University of Technology, 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

- **Automatic Speech Recognition – For the past three semesters** Sep 2023 – Present
 - Conducted weekly quizzes and workshops on **ESPNet** framework.
 - Supervisor: Dr. Hossien Sameti (Sharif University of Technology, Tehran, Iran)

SKILLS

• Programming Skills

VHDL
Verilog
HSPICE
Python
C/C++
HTML/CSS
JavaScript
Matlab

- Electrical Libraries
- Simulink

Assembly

• Machine Learning Skills

NLP

- NER
- Semantic Analysis
- Vision-Language
- LLM
- NLTK

Speech Processing

- ASR
- ESPNet

Computer Vision

- Segmentation
- Object detection

Classical AI Algorithms

• Tools

ISE Design Suite
Vivado Design Suite

- IP Core
- HLS
- Vitis
- Micro Blaze

Proteus 8
PCB Design (Altium Designer)
STM32 Microcontroller
Cadence (VLSI Designer)
Microwind
Arduino
Linux
Git
Docker
Jupyter Notebook
LaTeX

SELECTED PROJECTS

Heart Rate Calculation Using FPGA

- Implemented a MicroBlaze microprocessor on an FPGA with 8 GPIO ports using Vivado and Vitis.
- Programmed MicroBlaze using Vivado HLS for efficient heart rate calculations.

Trigonometric Functions Implementation on FPGA

- Implemented arctan and exponential functions using the CORDIC IP core in Xilinx ISE 14.6. [Link](#).

General-Purpose Board Design with FPGA and Microcontroller

- Designed and developed a buffer board with complete schematic and PCB layout using Altium Designer.

Binary multiplication in FPGA

- Developed and simulated three binary multiplier designs (Array, Carry-Save, and Standard) using Vivado. [Link](#).

CPU simulation on FPGA

- Designed and simulated a CPU with MIPS architecture in a 4-stage pipeline.
- Implemented RAM, ROM, ALU, and I/O interfaces.

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

- Fine-tuned Mini-Gemini (a pre-trained VLM) on a large dataset of radiology images for a Visual Question Answering (VQA) task.
- Created a new dataset of paired images and reports, achieving significant performance improvements on the test set.
- *Supervisor: Dr. Saeed Sharifian (Amirkabir University of Technology, Tehran, Iran)*

Gender Classifier Model Development

- 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](#).

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

- **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.
- **Member of Amirkabir Astronomy Club** Apr 2023
 - Designed and implemented astronomical events, engaging students and the public in astronomy-related activities.
- **Participated in a charity market** Feb 2024
 - Created and sold handmade goods to raise funds supporting underprivileged students.

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) |
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