Parsa Mohammadi | Curriculum Vitae

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| [GitHub](https://github.com/PARSA-MHMDI) | | [Linkedin - Free social media iconsLinkedIn](http://www.linkedin.com/in/parsa-mohammadi-0b079620a) | [Google scholar Icons, Logos, Symbole – Kostenloser Download ...Google Scholar](https://scholar.google.com/citations?user=zwg4308AAAAJ&hl=en&oi=sra) | |

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| EDUCATION |
| * **Amirkabir University of Technology (AUT)**,Tehran, IranSep 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*](https://doi.org/10.21203/rs.3.rs-4504934/v1)) | |

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| 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)* |

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| WORK EXPERIENCES |
| **Machine Learning Intern -** [Asr Gooyesh Pardaz](https://asr-gooyesh.com/en/) · Full-time, Tehran, Iran Jul 2023 – Sep 2023   * Trained an end-to-end Automatic Speech Recognition (ASR) model using **E-Branchformer** architecture and **ESPNet framwork** 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](https://huggingface.co/spaces/parsa-mhmdi/persian-asr). * *Supervisor: Dr. Hossien Sameti (Sharif University of Technology, Tehran, Iran)* |

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| 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)* |

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| 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 |

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| SELECTED PROJECTS |
| **Multi-Layer Perceptron (MLP) Implementation on FPGA**   * Developed and trained an **MLP** for speech recognition, implemented on a **Virtex-E 2000 FPGA**. * **Quantized** the model for **8-bit** calculations, achieving **83.4%** accuracy on the test set.   **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](https://github.com/PARSA-MHMDI/Trigonometric-functions-with-cordic).   **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.](https://github.com/PARSA-MHMDI/binary-multiplier)   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](https://parsam.eu.pythonanywhere.com/image_classifier/).  |  |  | | --- | --- | | COURSES | | | * Artificial Intelligence [Fall 2021] * Machine Learning [Fall 2023] | * Advanced Programming [Winter 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* | * 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* |  |  | | --- | | 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](https://drive.google.com/uc?export=download&id=14m-we5luWAGr5DW_X6Emrd3uJPh2riot)Nov 2022 * Ranked among **top teams** in Irancell Labs AI Hackathon.[Certificate link](https://quera.org/certificate/qlCweFPd/).Aug 2023 |   **LANGUAGE PROFICIENCY** | | | | * English (Exam date: 10/31/2024) | * Persian (Native) | * Kurdish (Native) | |