Erfan Moghadam

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EDUCATION

M.Sc in Computer Engineering at **Kharazmi University**, Tehran, Iran. GPA: **4.00/4.00** *2022 – Present*

- Thesis: Providing an Enhanced Clustering Algorithm for Vehicular Ad-hoc Networks, Advisor: Dr. Amir Asghari

B. Sc in Computer Engineering at **University of Zanjan**, Zanjan, Iran. GPA: **3.27/4** *2017 – 2022*

- Final Project: Time Series Forecasting with LSTMs for Daily Covid-19 Cases using PyTorch in Python, Advisor: Dr. Leila Safari

RESEARCH INTERESTS

- AI in Healthcare
- IoT
- Vehicular Ad-hoc Networks
- Generative AI

PUBLICATIONS

1. E. Moghadam, S. A. Asghari, M. B. Marvasti, P. Azizi, "Harmonizing Network Loads: A Survey of Load Balancing Strategies and Machine Learning Integration," *Under Review in Wiley, Computational Intelligence Journal.*
2. S. E. Asghari, E. Moghadam, S. A. Asghari, M. B. Marvasti, Y. Savaria, "IMICLiVAN: An Improved Method to Increase Cluster Lifetime in Vehicular Ad Hoc Networks (VANETs)," *Under Review in IEEE Access Journal.*

SELECTED RESEARCH EXPERIENCE AND ACADEMIC PROJECTS

Graduate Research and Projects, Kharazmi University, Tehran, Iran

- **Vehicular Ad-hoc Networks:** Proposed an improved clustering algorithm combining weighted formulas and machine learning to enhance cluster head selection and network lifetime. Conducted simulations using urban mobility models and Python.
- **Load Balancing and Machine Learning Integration:** Conducted an extensive review of over 60 academic articles, analyzing state-of-the-art techniques and formulating innovative strategies for integrating machine learning into load balancing solutions, with a focus on scalability and performance optimization.
- **Cancer Classification using Support Vector Machine (SVM):** Developed an SVM model to classify human cell records into benign or malignant categories.
- **Heart Attack Prediction using Classification:** Predicted heart attack risks using advanced classification models.
- **Mesh Network on Chip (NoC) Project:** Designed a NoC system using VHDL in an FPGA environment.
- **Single-Cycle and Pipelined MIPS Projects:** Designed and simulated MIPS processors using VHDL.
- **Full Scan Design and Test:** Converted a CPU adding machine to gate-level format using a netlist generator, then performed scan insertion on it and tested it using a virtual tester.
- **Car Segmentation with Agglomerative Hierarchical Clustering:** Used clustering methods to identify distinctive vehicle clusters, helping manufacturers with decisions on new model supply.
- **Customer Categorization of a Telecommunications Provider:** Worked with logistic regression to predict customer churn using a telecommunications dataset.

Undergraduate Research and Projects, University of Zanjan, Zanjan, Iran

- **Face Recognition Using ML:** Built a face recognition system using traditional computer vision techniques.
- **Patient Response to Drugs:** Analyzed drug effectiveness using decision tree classification.
- **Fuzzy Inference System for Restaurant Tipping:** Developed a fuzzy control system for tipping decisions in restaurants.
- **Software Engineering:** Gained familiarity with design patterns. Extracted UML, ER, DFD, flowchart, and

Gantt chart diagrams for various case studies, including a shop, hospital, music app, and social media app.

- **Database Project:** Designed and implemented a database system for various case studies, culminating in an online pet shop using SQL.

TEACHING EAXPERIENCE

Adjunct Lecturer, AmirKabir University of Technology (Tehran Polytechnic), Tehran, Iran:

- **Logic Circuit Laboratory (Undergraduate Course)** *(Spring 2024 – Fall 2024)*: Delivered lectures and hands-on training on digital logic circuit design and implementation. Taught Xilinx ISE, Verilog programming, and supervised FPGA-based projects like smart parking systems.

Teaching Assistant, University of Theran, Tehran, Iran:

- **Advance Computer Networks (PhD Course)** (*Fall 2023*): Collaborated to deliver lectures, grade assignments, and assist students with course material.

Teaching Assistant, Kharazmi University, Tehran, Iran:

- **Advance Computer Systems Architecture (Graduate Course)** *(Spring 2023)*: Taught pipeline architecture, single-cycle processors, and advanced system design. Supervised Verilog projects with a focus on practical implementation.
- **Fault Tolerant Systems (Graduate Course)** *(Spring 2023)*: Collaborated to deliver lectures on fault-tolerant systems and their applications in healthcare and IoT. Provided comprehensive support to ensure students' mastery of fault tolerance concepts and methodologies.

Teaching Assistant, University of Zanjan, Zanjan, Iran:

- **Natural Language Processing (Undergraduate Course)** (*Fall 2020*): Assisted in delivering lectures and guiding students through fundamental concepts of Natural Language Processing. Evaluated assignments and provided technical support for student projects.

ACADEMIC ACTIVITIES

AI in Action Workshop *(Fall 2024)*

- Conducted a workshop at Kharazmi University on practical AI applications in smart vehicles, computer vision, and neuroscience. Engaged participants through hands-on sessions focused on real-world problem-solving with AI.

Machine Learning with Python Workshop *(Fall 2020)*

- Led a workshop at Zanjan University to introduce machine learning fundamentals using Python. Simplified core concepts and provided practical exercises for participants to build basic machine learning models.

AWARDS AND HONORS

- Ranked 1st at the Faculty of Electrical and Computer Engineering, specializing in Computer Architecture, Kharazmi University of Tehran. (Fall 2022 – Present)
- Achieved top 1% in the Nationwide University Entrance Exam for M.Sc., securing Rank 172 out of approximately 20,000 applicants. (*January 2022*)
- Ranked in top 5 among 60 peer undergraduate students in the last two years in Computer Engineering Department, University of Zanjan, Zanjan, Iran. (*Fall 2021*)

SKILLS

Programming Languages: C, C++, Python, Verilog, VHDL, Java, C#

Tools & Frameworks: PyTorch, Scikit-learn, Pandas, NumPy, SQL, Matplotlib, Xilinx ISE, Quartus, ModelSim, .Net, SUMO

Other Skills: Machine Learning, Neural Networks, Digital System Design, Fault-Tolerant System Design, Time Series Analysis, Digital Test and Testable Design