Erfan Moghadam

(+98) 911-2199194 | erfanmoghadam@khu.ac.ir | erfanmoghaddam1999@gmail.com

EDUCATION

M.Sc. in Computer Engineering at Kharazmi University, Tehran, Iran. (*2022 – Present)*

- **Thesis:** Providing an Enhanced Clustering Algorithm for Vehicular Ad-hoc Networks
- **GPA:** 4.00/4.00 | **Advisor:** Dr. Amir Asghari

B.Sc. in Computer Engineering at University of Zanjan, Zanjan, Iran. *(2017 – 2022)*

- **Final Project:** Time Series Forecasting with LSTMs for Daily Covid-19 Cases using PyTorch
- **GPA:** 3.27/4 **| 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.*

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.

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.

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