Erfan Moghadam

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EDUCATION

Kharazmi University, **Tehran, Iran**   *2022 - Present*

Master of Science in Computer Engineering

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

University of Zanjan, **Zanjan, Iran**   *2017 – 2022*

Bachelor of Science in Computer Engineering

- GPA: **3.27/4.0**
- Final Project: Time Series Forecasting with LSTMs for Daily Covid-19 Cases using PyTorch in Python
- Supervisor: Dr. Leila Safari

RESEARCH INTERESTS

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

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. (*2022-2024*)

- **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. (*Fall 2023*)

- **Cancer Classification using Support Vector Machine (SVM):** Developed an SVM model to classify human cell records into benign or malignant categories. (*Fall 2023*)

- **Heart Attack Prediction using Classification:** Predicted heart attack risks using advanced classification models. (*Fall 2023*)

- **Mesh Network on Chip (NoC) Project:** Designed a NoC system using VHDL in an FPGA environment (Quartus-II, ModelSim). (*Spring 2023*)

- **Single-Cycle and Pipelined MIPS Projects:** Designed and simulated MIPS processors using VHDL. (*Fall 2022*)

- **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. (*Fall 2023*)

- **Car Segmentation with Agglomerative Hierarchical Clustering:** Used clustering methods to identify distinctive vehicle clusters, helping manufacturers with decisions on new model supply. (*Fall 2023*)

- **Customer Categorization of a Telecommunications Provider:** Worked with logistic regression to predict customer churn using a telecommunications dataset. (*Fall 2022*)

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

- **Final Project:** Time Series Forecasting of Covid-19 cases using LSTMs in PyTorch. (*Spring 2021*)

- **Face Recognition Using ML:** Built a face recognition system using traditional computer vision techniques. (*Fall 2020*)

- **Patient Response to Drugs:** Analyzed drug effectiveness using decision tree classification. (*Spring -2020*)

- **Fuzzy Inference System for Restaurant Tipping:** Developed a fuzzy control system for tipping decisions in restaurants. (*Fall 2019*)

- **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. (*Spring 2019*)

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

Visiting 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.

Teacher Assistant, University of Theran, Tehran, Iran:
- **Advance Computer Networks (PhD Course)** (*Fall 2023*)
  - Collaborated with Dr. Seyyed Amir Asghari to deliver lectures, grade assignments, and assist students with course material.

Teacher Assistant, Kharazmi University, Tehran, Iran:
- **Advance Computer Systems Architecture (Graduate Course)** (*Spring 2023*)
  - Delivered lectures on pipeline architecture, single-cycle processors, and advanced computer systems design under the supervision of Dr. Mohammadreza Binesh Marvasti.
  - Supervised Verilog-based projects, emphasizing practical application in system design.

- **Fault Tolerant Systems (Graduate Course)** (*Spring 2023*)
  - Collaborated with Dr. Seyyed Amir Asghari 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.

Teacher Assistant, University of Zanjan, Zanjan, Iran:
- **Natural Language Processing (Undergraduate Course)** (*Fall 2020*)
  - Assisted Dr. Leila Safari 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

REFERENCES

- **Dr. Mohammadreza Binesh Marvasti**
  Associate Professor, Department of Electrical and Computer Engineering, Kharazmi University, Tehran, Iran
  Email: marvasti@khu.ac.ir

- **Dr. Amir Asghari**
  Associate Professor, Department of Electrical and Computer Engineering, Kharazmi University, Tehran, Iran
  Email: asghari@khu.ac.ir

- **Dr. Ali Azarpeyvand**
  Associate Professor, Department of Electrical and Computer Engineering, University of Zanjan, Zanjan, Iran
  Email: azarpeyvand@znu.ac.ir

- **Dr. Leila Safari**
  Assistant Professor, Department of Electrical and Computer Engineering, University of Zanjan, Zanjan, Iran
  Email: lsafari@znu.ac.ir