ALIREZA MOHAMMADI

E-mail ◇ LinkedIn ◇ Github ◇ Web site ◇ Google Scholar

EDUCATION

B.Sc. in Computer Engineering, Islamic Azad University 2020 - 2024
Kermanshah, Iran
CGPA: **3.5**/4

RESEARCH INTERESTS

• AI for science • ML in IOT • ML • Optimization • Explainable AI

ACADEMIC EXPERIENCE

Research Assistant | *Islamic Azad University* | *Supervised by Dr.Parandin* 2022 - Present
• Coding and implementing an optimization formula utilizing ML models to enhance gate performance.
• Contributed to the development and implementation of various ML models, including RNN, CNN, FNN, Reinforcement Learning and meta-learning frameworks, for multiple journal publications.

Teaching Assistant | *Islamic Azad University* | *Supervised by Dr. Habibi* 2023
• TA of Computational Intelligence | • TA of Natural Language Processing

As a Teaching Assistant, I conducted teaching sessions, led class discussions, and provided support in understanding complex concepts. I also assisted students with assignments, offered feedback, and guided them through coding and problem-solving exercises.

PUBLICATIONS

ACADEMIC JOURNALS

1. A Yavari, **A Mohamadi**. "FreqAttXpose: Frequency-based Attribution for eXplanatory Insights" (In Prep, for **NeurIPS 2025**)
2. **A Mohamadi**, F Parandin, P Karami. "Designing an Optical Half-Adder Based on Two-Dimensional Photonic Crystals Using the ML-FOLD Method" (In Prep)
3. F Parandin, **A Mohamadi**, P Karami. "All-Optical XOR Gate Design Using Photonic Crystals and ML-FOLD Optimization" (Submitted)
4. **A Mohamadi**, F Parandin, P Karami. "Design and Optimization of a Photonic Crystal-Based All-Optical NOR Gate Using Deep Reinforcement Learning" (Submitted)
5. **A Mohamadi**, F Parandin, P Karami. "Meta-Learning and Formula Optimization for All-Optical XOR, OR, and NOT Logic Gates: The ML-FOLD Method" (Under review in Engineering Applications of Artificial Intelligence) [PDF] (***Q1, IF:7.5)***
6. F Parandin, P Karami, **A Mohamadi**. "Machine Learning-Driven Optimization of Photonic Crystal Structures for Superior Optical NOR Gate Performance" Applied Optics, 63(25), 6666-6673.[Link] [PDF] (***Q2, IF:1.9)***
7. F Parandin,**A Mohamadi**, P Karami. "Enhancing integrated optical circuits: optimizing all-optical NAND and NOR gates through deep learning and machine learning" Optical and Quantum Electronics 2024 Vol. 57 Issue 1 Pages 73 [Link] [PDF] (***Q2, IF:3.3))***
8. F Parandin; **A Mohamadi**. "Designing and Optimizing a Photonic Crystal-Based All-Optical XOR Gate Using Machine Learning". Majlesi Journal of Electrical Engineering, 2023.[Link+PDF] (***Scopus indexed***)
9. **A Mohamadi**, M Habibi, F Parandin. "Integration of Clinical, Genetic, and Molecular Features in Predicting Castration Resistance Events in Prostate Cancer: A Comprehensive Machine Learning Analysis". Journal of Electrical and Computer Engineering Innovations (JECEI).[Link+PDF] (***Google Scholar indexed)***

CONFERENCE PROCEEDINGS

9. **A Mohammadi**, H Ghahramani, SA Asghari, M Aminian. "Securing Healthcare with Deep Learning: A CNN-Based Model for medical IoT Threat Detection" 19th Iranian Conference on Intelligent Systems) [PDF] [Presentation] |Code| |Link| **(*IEEE indexed*)**
10. **A Mohammadi**, F Parandin, H Ghahramani. "Neural Network-Driven Optimization of Photonic Crystal-Based All-Optical NOT Gate Design" Third International Conference on Distributed Computing and High Performance Computing (DCHPC).IEEE,2024.[Link] [PDF] **(*IEEE indexed*)**
11. F Parandin, **A Mohammadi**. "Enhancing the Performance of Photonic Crystal AND Gates with Machine Learning Optimization" Third International Conference on Distributed Computing and High Performance Computing (DCHPC).IEEE,2024.[Link] [PDF] **(*IEEE indexed*)**

AWARDS & HONORS

- Conducting a workshop on 'An Introduction to Artificial Intelligence' at Islamic Azad University 2023
- Interviewed by Hamshahri newspaper and hispanTV as the Student Inventor [Link] 2016
- Ranked first in Laboratory Sciences in Kermanshah province 2016
- Selected idea for the 8th Student Festival Nanoscience and Nanotechnology [Link] 2015
- Recognized exceptional talent by National Organization for Development of Exceptional Talents 2014

SKILLS

Programming	Python
Libraries	Scikit-learn, PyTorch, Auto-sklearn, TensorFlow, Matplotlib, NumPy, Pandas
Skills	Machine Learning, Data Analysis, Research Prowess, Optimization

LICENSES & CERTIFICATIONS

- Supervised Machine Learning: Regression and Classification [Link] Coursera Stanford online
- Python for Data Science and Machine Learning Bootcamp Udemy

SELECTED COURSES

- Foundations of NLP and Speech (4/4)
- Artificial Intelligence and Expert Systems (4/4)
- Foundations of Computational Intelligence (4/4)
- Foundations of Computer Vision (4/4)

LANGUAGES

- Duolingo English Test: 110/160 ≡ IELTS score of 6
- Scheduled for TOEFL – May
- Farsi: Native speaker

PROJECTS

Securing Healthcare with Deep Learning: A CNN-Based Model for Medical IoT Threat Detection
Developed and implemented a CNN-based model for detecting Threat in IoMT environments. The proposed model achieved a perfect accuracy of 0.99 across binary, categorical, and multiclass classification tasks, outperforming previous state-of-the-art methods. This code was developed for a paper accepted at the 2024 IEEE Conference on Intelligent Systems (ICIS). [Github]

Optimization of All-Optical Gate Design Using Neural Networks | *supervised by Dr. Parandin*
This repository contains code and resources related to a comprehensive study on the application of neural networks to optimize design parameters for an all-optical NOT gate using photonic crystals. The research focuses on improve optical gate simulation software. |Code|