ALIREZA MOHAMMADI

E-mail | LinkedIn | GitHub | Website | Google Scholar

EDUCATION

B.Sc. in Computer Engineering, Islamic Azad University 2020 - 2025
Kermanshah, Iran
CGPA: **3.5**/4

RESEARCH INTERESTS

• AI Safety • AI Alignment • Explainable AI • AI for science

ACADEMIC EXPERIENCE

Research Intern | *ZEISS Lab @Medical University of Vienna, Austria (Remote)* Jan 2025 - Present
• Collaborated on designing and evaluating frequency-based explainability methods for neural networks.
• Co-authored manuscript with international team of researchers from Medical University of Vienna and ZEISS Lab.

Research Assistant | *Islamic Azad University* | *Supervised by Dr.Parandin* 2022 - 2025
• Contributed to the development and implementation of various ML models, including RNN, CNN, FNN and meta-learning frameworks.

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

Citations 48 - h-index 4

1. **A Mohamadi**, A Yavari. "Survival at Any Cost? LLMs and the Choice Between Self-Preservation and Human Harm" (Preprint)
2. A Yavari, **A Mohamadi**, E Beydagh, R A. Leitgeb. "FreqAttXpose: Frequency-Aware Model Parameter Explorer: A new attribution method for improving explainability" (Preprint)
3. S Roshani, S I. Yahya, **A Mohammadi**, P Karami, M Assaad, F Hazzazi, F Azmadi Hussin, S Roshani. "Design and Optimization of a Photonic Crystal-Based All-Optical NOR Gate Using Deep Reinforcement Learning" (Under review in Plasmonics)
4. **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 second-round review) ***(IF:8.0)***
5. 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 ***(IF:4.0)***
6. **A Mohamadi**, F Parandin, P Karami, S Olyaee. "Design and Optimization of Optical NAND and NOR Gates Using Photonic Crystals and the ML-FOLD Algorithm". Photonics ***(IF:2.1)***
7. F Parandin, P Karami, **A Mohamadi**. "Machine Learning-Driven Optimization of Photonic Crystal Structures for Superior Optical NOR Gate Performance" Applied Optics ***(IF:1.9)***
8. F Parandin; **A Mohamadi**. "Designing and Optimizing a Photonic Crystal-Based All-Optical XOR Gate Using Machine Learning". Majlesi Journal of Electrical Engineering. ***(Scopus indexed)***

CONFERENCE PROCEEDINGS

10. **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 (***IEEE indexed***)
11. **A Mohammadi**, F Parandin, H Ghahramani. "Neural Network-Driven Optimization of Photonic Crystal-Based All-Optical NOT Gate Design" International Conference on Distributed Computing and High Performance Computing,2024. (***IEEE indexed***)
12. F Parandin, **A Mohammadi**. "Enhancing the Performance of Photonic Crystal AND Gates with Machine Learning Optimization" International Conference on Distributed Computing and High Performance Computing,2024. (***IEEE indexed***)

AWARDS & HONORS

- Received admission offer for the M.Sc. in Computer Engineering at NC State University (NC, USA) 2025
- One of my papers gained significant attention in the AI research community featured by several technology news outlets [1], [2] and was shared on social media platforms [3], [4] 2025
- Interviewed by Hamshahri newspaper and hispanTV as the Student Inventor 2016
- Selected idea for the 8th Student Festival Nanoscience and Nanotechnology 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

PROJECTS

Securing Healthcare with Deep Learning: A CNN-Based Model for Medical IoT Threat Detection ★ 18
Developed and implemented a CNN-based model for detecting threats 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.

DECIDE-SIM *(In collaboration with Med Uni of Vienna)* ★ 5
DECIDE-SIM is a groundbreaking, open-source simulation framework designed to evaluate the ethical and cooperative behaviors of Large Language Model (LLM) agents in high-stakes survival scenarios. Our framework provides a systematic testbed to investigate how AI agents balance self-preservation, cooperation, and moral constraints when faced with resource scarcity and critical ethical dilemmas.