

Pegah Mohammadipour

Education

Ph.D. in Mathematics The Pennsylvania State University , PA, USA <i>Advisor: Prof. Xiantao Li</i> <i>Focus: Numerical Analysis of Quantum Algorithms for Open Quantum Systems</i>	August 2022 - Present
B.Sc. in Mathematics and Applications University of Tehran , Tehran, Iran <i>Undergraduate Thesis: The Geometric Concept of Parallel Transport along Curves with some Physical Interpretations</i>	September 2017 - September 2021
Minor in Computer Engineering University of Tehran , Tehran, Iran	February 2019 - August 2021
Diploma in Mathematics and Physics Aboureihan Educational Complex , Tehran, Iran	September 2010 - July 2017

Publications

- **Pegah Mohammadipour**, X. Li. *Reducing Circuit Depth in Lindblad Simulation via Step-Size Extrapolation*, *Physical Review A*, 112(6):062206, 2025, doi: [10.1103/dzpc-m1p4](https://doi.org/10.1103/dzpc-m1p4).
- **Pegah Mohammadipour**, X. Li. *Direct Analysis of Zero-Noise Extrapolation: Polynomial Methods, Error Bounds, and Simultaneous Physical-Algorithmic Error Mitigation*, *Quantum*, 9, 1909 (2025)., doi: [10.22331/q-2025-11-14-1909](https://doi.org/10.22331/q-2025-11-14-1909).
- H. Mahdavi, P. Mahdavinia, A. Farhadi, **Pegah Mohammadipour**, S. Malek, P. Mohammadipour, M. Daliri, A. Hashemi, A. Khasahmadi, V. Honavar. *CombiGraph-Vis: A Multimodal Olympiad Benchmark for Discrete Mathematical Reasoning*, *NeurIPS 2025 Workshop MATH-AI* arXiv:2510.27094v1.,
- H. Mahdavi, P. Mahdavinia, S. Malek, **Pegah Mohammadipour**, S. Malek, P. Mohammadipour, A. Hashemi, M. Daliri, A. Farhadi, A. Khasahmadi, N. Mireshghallah, V. Honavar. *RefGrader: Automated Grading of Mathematical Competition Proofs using Agentic Workflows*, *NeurIPS 2025 Workshop MATH-AI*, arXiv:2510.09021v1.
- H. Mahdavi, A. Hashemi, M. Daliri, **Pegah Mohammadipour**, A. Farhadi, S. Malek, Y. Yazdanifard, A. Khasahmadi, V. Honavar. *Brains vs. Bytes: Evaluating LLM Proficiency in Olympiad Mathematics*, *COLM Conference*, 2025, arXiv:2504.01995v2.

Research Experience

Graduate Research Assistant The Pennsylvania State University , PA, USA <i>Quantum Error Mitigation, Quantum Simulation in Open Quantum Systems</i> <i>Thesis Advisor: Prof. Xiantao Li</i>	May 2023 - Present
Research Assistant Institute for Research in Fundamental Sciences (IPM) , Tehran, Iran <i>Functional Inequalities for Quntum Correlations in Networks</i> <i>Advisor: Dr. Salman Beigi</i>	September 2021 - May 2022

	Research Assistant School of Electrical and Computer Engineering , University of Tehran, Tehran, Iran <i>Deep learning-based image compression</i> <i>Advisor: Dr. Farhad Pakdaman</i>	July 2019 - September 2020
Teaching Experience	Graduate Teaching Associate Department of Mathematics , The Pennsylvania State University, PA, USA	August 2022 - May 2025
	• MATH 231 - Multivariable Calculus	
	Teaching Assistant School of Mathematics, Statistics and Computer Science , University of Tehran, Tehran, Iran	September 2019 - January 2022
	• <i>Fall 2021</i> : Differential Equations	
	• <i>Spring 2020</i> : Calculus 2	
	• <i>Fall 2020</i> : Data Structures	
	• <i>Spring 2020</i> : Calculus 2	
	• <i>Fall 2019</i> : Introduction to Computer Programming	
	English Teacher Safir Language Academy , Tehran, Iran	March 2018 - October 2018
Professional Activities	QSIM Conference IBM, NYC, NY, USA	August 2025
	QSIM Conference and Summer School University of Rhode Island, Kingston, Rhode Island, USA	August 2024
	Graduate Summer School in Stochastic Quantization SLMath, Berkeley, California, USA	July 2024
	Graduate Summer School in Concentration Inequalities and Localization Techniques in High Dimensional Probability and Geometry SLMath, Berkeley, California, USA	July 2023
	Undergraduate Summer School on Experimental QIP (USEQIP) Remote, University of Waterloo, Canada	May 2021 - July 2021
	Qiskit Global Summer School 2021: Quantum Machine Learning Remote, IBM Quantum	July 2021
	Qiskit Global Summer School 2020: Introduction to Quantum Computing and Quantum Hardware Remote, IBM Quantum	July 2020
	Game Theory Summer School Institute for Research in Fundamental Sciences (IPM), Tehran, Iran	August 2019

Deep Learning Summer School(UTDLSS)

School of Electrical and Computer Engineering, University of Tehran August 2018

Skills

- **Languages:** Persian(Native), English(Fluent), Spanish(Intermediate)
- **Programming Languages:** C, C++, Python, R, MATLAB, Octave, HTML/CSS
- **Software & Tools:** Qiskit, L^AT_EX, Jupyter Notebooks
- **Operating Systems:** Ubuntu, Windows

Leadership & Volunteering

- **Organizer, Quantum Computation Reading Group**
Penn State University, State College, PA, USA Fall 2025
- **Poster Judge, ECoS Undergraduate Research Exhibition**
Penn State University, State College, PA, USA Fall 2024
- **Editor-in-Chief, *Jonge Riazi* Student Mathematics Magazine**
School of Mathematics, Statistics, and Computer Science, University of Tehran, Tehran, Iran January 2020 – September 2021
 - Revitalized the mathematics magazine after a 24-year hiatus.
 - Recruited and mentored a team of students to develop, edit, and finalize article content.
- **Elected Committee Member, University of Tehran Mathematics Student Association**
University of Tehran, Tehran, Iran September 2018 – September 2020
 - Organized *Math Suppers*, a weekly series of talks on mathematical topics and their applications.
 - Created and coordinated student-led mathematics study groups and workshops.

Awards & Honors

- **Honorable Mention**, Mary Lister McCammon Award for Distinguished Undergraduate Teaching
- **Graduate Teaching Associate Status**, in recognition of commitment to undergraduate education
- **2nd Place**, Penn State ICDS Symposium Poster Competition 2025
- **Top 1% Rank** in the 2017 Iranian National University Entrance Examination (*Concour*) in Mathematics and Physics