Pegah Mohammadipour

Education

Ph.D. in Mathematics   August 2022 - August 2026 (Expected)
The Pennsylvania State University, PA, USA
Advisor: Prof. Xiantao Li
Focus: Numerical Analysis for Open Quantum Systems

B.Sc. in Mathematics and Applications   September 2017 - September 2021
University of Tehran, Tehran, Iran
Undergraduate Thesis: The Geometric Concept of Parallel Transport along Curves with some Physical Interpretations

Minor in Computer Engineering   February 2019 - August 2021
University of Tehran, Tehran, Iran

Diploma in Mathematics and Physics   September 2010 - July 2017
Aboureihan Educational Complex, Tehran, Iran

Preprints & Publications

- **Pegah Mohammadipour**, X. Li. *Reducing Circuit Depth in Lindblad Simulation via Step-Size Extrapolation*, arXiv:2507.22341v1 *Accepted in PRA.*

- **Pegah Mohammadipour**, X. Li. *Direct Analysis of Zero-Noise Extrapolation: Polynomial Methods, Error Bounds, and Simultaneous Physical-Algorithmic Error Mitigation*, arXiv:2502.20673 *Accepted in the Quantum Journal.*

- 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*, arXiv:2510.27094v1, *NeurIPS 2025 Workshop MATH-AI.*

- 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*, arXiv:2510.09021v1, *NeurIPS 2025 Workshop MATH-AI.*

- 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*, arXiv:2504.01995v2, *COLM Conference, 2025.*

Research Experience

Graduate Research Assistant   May 2023 - Present
The Pennsylvania State University, PA, USA
Quantum Error Mitigation, Quantum Simulation in Open Quantum Systems
Thesis Advisor: Prof. Xiantao Li

Research Assistant   September 2021 - May 2022
Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
Functional Inequalities for Quntum Correlations in Networks
Advisor: Dr. Salman Beigi

Research Assistant   July 2019 - September 2020
School of Electrical and Computer Engineering, University of Tehran,
Tehran, Iran
Deep learning-based image compression
Advisor: Dr. Farhad Pakdaman

Teaching Experience

Graduate Teaching Associate   August 2022 - May 2025
Department of Mathematics, The Pennsylvania State University, PA, USA

- MATH 231 - Multivariable Calculus

Teaching Assistant   September 2019 - January 2022
School of Mathematics, Statistics and Computer Science, University of Tehran,
Tehran, Iran

- *Fall 2021:* Differential Equations
- *Spring 2020:* Calculus 2
- *Fall 2020:* Data Structures
- *Spring 2020:* Calculus 2
- *Fall 2019:* Introduction to Computer Programming

English Teacher   March 2018 - October 2018
Safir Language Academy, Tehran, Iran

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, LaTeX, 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

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