

Fatemeh Shafizadeh

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EDUCATION

Shahid Beheshti University

B.Sc. in Physics; GPA: 3.75/4 (17.73/20)

Tehran, Iran

Sep 2020 – Jun 2025 (Expected)

RESEARCH INTERESTS

- Theoretical Condensed Matter Physics
- Quantum Foundation
- Mathematical Physics
- Quantum Machine Learning
- Quantum Computing

RESEARCH EXPERIENCE

Research Assistant

Shahid Beheshti University

Tehran, Iran

Nov 2023 – Present

- Developed quantum algorithms for anomaly detection using Quantum Restricted Boltzmann Machines (QRBM)s within the Quantum Information and Computation Group under the supervision of [Dr. S.M.H. Halataei](#).
- Designed quantum-inspired algorithms utilizing Coherent Ising Machines (CIMs), achieving significant performance improvements with higher F1-scores compared to classical RBMs and other quantum algorithms.
- Currently preparing a manuscript to publish these findings.

PROJECTS

Classification of Pottery Motifs Using Machine Learning

- Collaborated with a multidisciplinary team to integrate computational methods into archaeological research.
- Applied machine learning techniques to classify pottery motifs and distinguish between three cultural origins.

TEACHING EXPERIENCE

Teaching Assistant

Shahid Beheshti University

Tehran, Iran

Oct 2023 – Present

- Solid state Physics I, Assistant to [Dr. M. Hafez-Torbati](#) (Spring Semester 2024)
- Physics I, Assistant to [Dr. M. Hafez-Torbati](#) (Fall Semester 2023 and 2024)

RELEVANT COURSES AND GRADES

Advanced Quantum Mechanics (<i>Graduate-Level Course</i>)	<i>Ongoing</i>
Foundation of Numerical Simulations	<i>Ongoing</i>
Group Theory	<i>Ongoing</i>
Quantum Computing (<i>Graduate-Level Course</i>)	18/20
Quantum Mechanics I	19.5/20
Quantum Mechanics II	18.5/20
Solid State Physics I	17.25/20
Physics Project	20/20
Mathematical Physics I	16.3/20
Mathematical Physics II	20/20
Mathematical Physics III	17.7/20
Thermodynamics and Statistical Mechanics I	19.2/20
Thermodynamics and Statistical Mechanics II	18.75/20
Computer Programming	16.24/20

For the full grades, see [here](#).

VOLUNTEER EXPERIENCE

Member of Scientific Association of Physics students

Tehran, Iran

Shahid Beheshti University

Nov 2022 – Sep 2023

- Collaborated with the executive team to plan and organize events, including workshops and social gatherings.
- Contributed innovative ideas and strategic insights during weekly meetings to improve the association's impact and operational efficiency.

Representative of the Department of Physics to the University President

Tehran, Iran

Shahid Beheshti University

Nov 2023 – Present

- Acted as a student representative, voicing student interests and concerns within the Faculty of Physics.
- Improved the academic environment through collaboration with faculty and administration, advocating for enhanced educational resources and support for students.

Content writer – Quark Scientific journal

Tehran, Iran

Shahid Beheshti University

Nov 2023 – May 2024

- In the second issue of the journal, I translated a report about New type of entanglement that allows scientists to see inside nuclei.
- In the third issue of the Journal, our group wrote about Quantum Teleportation.

AWARDS

Top-Ranked Student Award: Ranked among the top 10% of students in the Department of Physics for 2023 and 2024, based on GPA.

SKILLS

Programming: Python, Mathematica

Tools and Technologies: NumPy, Matplotlib, Pandas, PyTorch, Git, L^AT_EX, Microsoft Office

Soft Skills: Time Management, Teamwork, Problem-Solving, Literature Review

Additional Skills: Playing the piano, Basketball

Languages: Persian (Native), English

TALKS

Modern Machine Learning and Particle Physics (*slides*)

Tehran, Iran

Shahid Beheshti University, Faculty of Physics

Dec 2024

Restricted Boltzmann Machine Derivations (*slides*)

Tehran, Iran

Sharif University of Technologies, Center of Quantum Sciences

Sep 2024

WORKSHOPS AND CONFERENCES

Quantum Photonic Technologies Winter School

Mar 2024

Organized by Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran

Second Quantum Technologies Workshop

Mar 2024

Organized by PsiKet Academy, Sharif University of Technologies, Tehran, Iran

Quantum Computing based on Superconducting Circuits Conference

Feb 2024

Organized by IQTEC and the Faculty of Physics, Kharazmi University, Tehran, Iran

Cooperation with SESAME International Laboratory Conference

Feb 2024

Organized by Institute For Research In Fundamental Sciences (IPM), Tehran, Iran

The 28th Special School on Topics in Physics

July 2023

Organized by Institute for Advanced Studies in Basic Sciences (IASBS) in Zanjan, Iran