

Shahram Babaie

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Personal Statement

I am a Ph.D. candidate in Computer Science at the University at Buffalo, with a research focus on Quantum Computing. Seeing Quantum Technology as a dominant topic of the 21st century, I decided to pursue a second Ph.D. to focus entirely on this state-of-the-art discipline. I am passionate about leveraging Quantum Technology to drive interdisciplinary innovations and contribute to the ongoing transition from classical to quantum paradigms. I firmly believe that the quantum industry will revolutionize technology, introduce groundbreaking products to market, and amaze humanity.

Technical Skills

- **Programming Languages:** Python, C/C++, and Matlab.
- **Simulation Software:** Qiskit, Cirq, Modelsim, Packet Tracer, NS3, and HPSIM.
- **Others:** Wireshark, HTML, LaTeX, and familiar with Git and Github.

Experiences

Teacher Assistantship — University at Buffalo, Buffalo, USA Jan. 2023–Present

- Assisted in the classroom, grading the assignments, and held office hours for over 150 students per semester.
- Taught the "Modern Networking Concepts" course to both graduate and undergraduate students in the summer of 2024.
- Focused on the physical and mathematical principles of underlying quantum computing, along with well-known Quantum Algorithms and Theories.

Research on Distributed CSS codes — University at Buffalo, Buffalo, USA..... Aug. 2024–Dec. 2024

- Conducted research on quantum bit-phase-flip error correction based on CSS codes and GHZ states in a distributed architecture to share encoding and decoding overheads across multiple QPUs.
- Submitted a paper based on this research to a conference.

Research on Distributed Quantum Error Correction — University at Buffalo... Dec. 2023–Aug. 2024

- Conducted research on Quantum Error Correction, specifically focusing on its implementation in a Distributed Architecture with multiple QPUs to address the limitations of physical qubits per QPU. Results are available on [ArXiv](https://arxiv.org/abs/2408.12345) and its paper has been accepted at the IEEE International Conference on Quantum Communications, Networking, and Computing (QCNC 2025).
- Acknowledged in the second edition (2024) of "Dancing with Qubits" Book by Robert S. Sutor: Thanked in the "About the Author" section for insight and inspiration.

Programming a Quantum Simulator — University at Buffalo, Buffalo, USA..... Oct. 2023–Dec. 2023

- Developed a Python-based quantum simulator from scratch, implementing all fundamental quantum gates.
- Programmed a simplified version of Qiskit in Python, including simulation, measurement, 2D drawing, and histogram functions.

Faculty Member — Islamic Azad University, Tabriz, Iran..... Sep. 2006 – Dec. 2022

- Led the CE Department as Head (2009-2012) and Deputy (2006-2009), managed over 1500 students
- Supervised more than 100 M.Sc. theses on topics including Computer Architecture, Computer Networks, and Fault-tolerant and Reliable Systems.
- Taught Computer Architecture and Computer Networks courses to over 400 students each semester.
- Published 60+ research papers on Computer Hardware, Reliability, and Communication Networks.
- Planned and managed the design, implementation, construction, and sale of four educational kits and preteen toys.
- Awarded the Prosperous Research Center Manager Award (2014) for fostering practical thinking among students, and the Head of Research Center Top Booth Award (2014) at the High-Tech and New Technologies exhibition.

Scholarly and Academic Service Feb. 2015 – Dec. 2022

- Served as Associate Editor for three international journals, i.e., SCN, IJCIT, and BIJCS.
- Acted as an Editorial Board Member of over 15 journals, such as ASCS, ECIJ, IJESA, IJRDO, JEDT, CCDS, and IJNIET.
- Reviewed 100+ research papers for top-ranked international journals and conferences.
- Processed 25+ conference papers as a senior reviewer.

Education

- Ph.D. Candidate in Computer Science, University at Buffalo, The State University of New York, USA (2023-present).
- Ph.D. in Computer Engineering (Computer Architecture), Islamic Azad University, Science and Research Branch, Tehran, Iran (2012).
- M.Sc. in Computer Engineering (Computer Architecture Systems), Islamic Azad University, Science and Research Branch, Tehran, Iran (2006).
- B.S. in Computer Engineering (Hardware), Sadjad University of Technology, Mashhad, Iran (2004).

Languages

- English (Proficient)
- Persian (Native)
- Turkish (Native)
- Kurdish (Beginner)