

DANESH MORALES-HASHEMI

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EDUCATION

University of Waterloo September 2020 - April 2025
Bachelor of Mathematics - Mathematical Physics - Pure Mathematics Minor

RESEARCH EXPERIENCE

Undergraduate Research Assistant May 2024 – August 2024
Institute for Quantum Computing (IQC) Waterloo, ON

- Accepted into the **Undergraduate School on Experimental Quantum Information Processing (USEQIP)**, a two-week program on the theoretical and experimental study of quantum information.
- Received the **Undergraduate Research Award (URA)** to work at the Institute for Quantum Computing.

Undergraduate Research Assistant September 2023 – December 2023
University of Waterloo - Department of Applied of Mathematics Waterloo, ON

- Researched about the **bilinear controllability** of the 1-dimensional **Fokker-Planck equation**.
- Learned about **control theory, partial differential equations, functional analysis** with programming skills essential for investigating the controllability of the Fokker-Planck equation.

TEACHING EXPERIENCE

General Undergraduate Teaching Assistant September 2023 – December 2023
University of Waterloo – Faculty of Engineering Waterloo, ON

- Facilitated weekly tutorials and help sessions for **1200+** first-year students taking **Linear Algebra**.
- Held office hours **30+** hours per week to provide individualized support to **10+** students daily.
- Attended course lectures and meetings with instructors to stay up-to-date on course content.
- Collaborated with other TAs and instructors to ensure consistent and fair grading.
- Provided feedback to course instructors on student progress and areas for improvement.

Instructional Support Assistant January 2022 – April 2022
University of Waterloo - Faculty of Mathematics Waterloo, ON

- Automated grading and plagiarism checking scripts applied on over **5000 submissions**, reducing significantly the time spent grading assignments and successfully detecting **8** plagiarism cases.
- Conducted weekly office hours to **teach 180+ students** the fundamentals of Computer Science.
- Co-ordinated weekly meetings with **6** Teaching Assistants to assist them in assignment grading.
- Developed sample solutions, marking schemes, and annotations for **9** assignments during the semester.

PROJECTS

- 🔗 **Variational Quantum Circuit Optimization** | *Jupyter, Qiskit, PennyLane*
- Successfully optimized a variational quantum circuit using PennyLane and Qiskit.
 - Developed a custom optimization algorithm for the variational quantum circuit, demonstrating proficiency in quantum algorithm design.
 - Implemented gradient-based optimization techniques to efficiently update the trainable parameters of the quantum circuit for minimal expectation values.

RELEVANT COURSES

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|-----------------------------|-------------------------|---------------------------|
| • Calculus 1/2/3/4 | • Linear Algebra 1/2 | • Statistics |
| • Computational Mathematics | • ODEs and PDEs | • Differential Geometry |
| • Quantum Theory | • Complex/Real Analysis | • Groups and Ring Theory |
| • Quantum Information | • Comp. Methods for DEs | • Galois and Field Theory |

AWARDS

- University of Waterloo **President’s Scholarship** 2020. (\$2,500)
- Full Undergraduate Educational Excellence Scholarship** 2019
National Secretary of Science and Technology of Panama (\$250,000 USD)