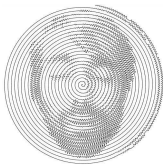
SUMIT SIJHER

smtsjhr@pm.me smtsjhr.com [1] sumit-sijher [2] smtsjhr [3] +408 650 4001



Education

University of Waterloo / Institute for Quantum Computing — **Ontario, CA**

★ **PhD (ABD) Applied Mathematics (Quantum Information)** — **2016 – 2018**
Recipient of Mike and Ophelia Lazaridis Graduate Fellowship

★ **MMath Applied Mathematics (Quantum Information)** — **2013 – 2015**
Supervisor: Dr. Robert König
Thesis: "Topological Quantum Computation and Protected Gates" **[5]**

University of California Santa Cruz — **California, USA**

★ **BS Physics & BA Pure Mathematics** — **2013**

Tools

Languages
• Python • Javascript • Java
• Mathematica

Quantum Frameworks
• Qiskit • Q# • Cirq

Markup
• LaTeX • HTML • CSS

Experience

RCFE Administrator — 2020 – 2021
Harvy's Home Care — **California, USA**

★ Harvy's Home Care is a family owned and operated Residential Care Facility for the Elderly (RCFE). I served as a licensed Administrator certified by California Department of Social Services, medication technician, caregiver, and staff trainer.

Contractor — 2019
Brilliant Worldwide (Brilliant.org) — **California, USA**

★ Brilliant is a STEM educational website/app focused on interactive content with over 4 million registered users. I produced written, graphic, and interactive content for courses in Quantum Computing utilizing the HTML5 Canvas with Javascript.

Researcher — 2017 – 2018
Quantum Benchmark — **Ontario, CA**

★ Quantum Benchmark is a startup founded in 2017 where I did research and software development on methods for error characterization, validation, and optimization for quantum computation and quantum information processing devices.

PhD Student — 2016 – 2018
Institute for Quantum Computing / University of Waterloo — **Ontario, CA**

★ Conducted theoretical research in two main areas:

Topological Quantum Computation:
- Addressed computational resource theoretic questions for topological quantum computation and topological phases of matter.
- Characterized fault-tolerant quantum gates and established complexity theoretic results on their classical simulability.

Quantum Error Correction and Characterization:
- Developed protocols for error diagnostics, with an emphasis on Randomized Benchmarking techniques.
- Implemented algorithms for the efficient sampling and generation of Clifford gates for Randomized Benchmarking protocols.
- Developed and analyzed protocols for benchmarking measurement operators for quantum error correction and fault-tolerance.

★ Coursework:
- *Quantum Information Processing* with Richard Cleve
- *Quantum Noise Processes* with Na Young Kim
- *Theory of Quantum Information* with John Watrous
- *Applied Functional Analysis* with Edward Vrscay
- *Implementations of Quantum Information Processing* with Christopher Wilson
- *Numerical Analysis* with Jeff Orchard
- *Quantum Error Correction and Fault-Tolerance* with Daniel Gottesman and Robert König

★ Published over 80 technical blog posts giving exposition and deriving results from the quantum computing literature. **[4]**

Research Assistant — 2013 – 2015
Institute for Quantum Computing / University of Waterloo — **Ontario, CA**

★ Conducted theoretical research under the supervision of Dr. Robert König.
- Research areas included quantum computation, algorithms, and information theory, with a focus on applying topological quantum computation and topological quantum field theory for quantum error correction and fault tolerance.
- Authored a Master's Thesis: *"Topological Quantum Computation and Protected Gates"*. **[5]**
- Published in The Journal Of Mathematical Physics: *"Protected gates for topological quantum field theories"* with Michael E Beverland, Oliver Buerschaper, Robert König, Fernando Pastawski, John Preskill, Sumit Sijher **[6]**

Teaching Assistant — 2013 – 2015
University of Waterloo — **Ontario, CA**

★ Teaching assistant for undergraduate courses in the Faculty of Mathematics:
- MATH 117: *Calculus 1 for Engineering*
- MATH 138: *Calculus 2 for Honours Mathematics*
- MATH 118: *Calculus 2 for Engineering*
- MATH 235: *Linear Algebra for Honours Mathematics*
- MATH 128: *Calculus 2 for the Sciences*
- MATH *109: Mathematics for Accounting*

Links

[0] Resume: smtsjhr.com/resume **[1] Homepage:** smtsjhr.com **[2] LinkedIn:** linkedin.com/in/sumit-sijher/
[3] Github: github.com/smtsjhr **[4] Blog:** smtsjhr.com/blog **[5] Thesis:** smtsjhr.com/thesis **[6] Papers:** smtsjhr.com/papers