

NATE STEMEN

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SUMMARY

Research engineer experienced in quantum error mitigation, circuit compilation, and translating quantum research into practical tools for near-term devices. Lead developer of `mitiq`, a widely-used open-source Python library for error mitigation.

EDUCATION

University of Waterloo	MMath in Applied Mathematics	2020–2022
• Thesis:	<i>Quantum Circuit Compilation from the Ground Up</i>	advised by Joel Wallman
New York University	B.Sc. in Mathematics and Physics	2013–2017
• Thesis:	<i>An Investigation of Q-Balls</i>	advised by Luciano Medina

EMPLOYMENT

Visiting Researcher	QuSoft / University of Amsterdam	Jan–March 2026
• Working to understand limits of compiling parametrized circuits.		
• Mentoring students on quantum computing software project.		
Member of Technical Staff	Unitary Foundation	Mar 2022–Dec 2025
• Technical lead and maintainer of the open-source Python library <code>mitiq</code> for quantum error mitigation (350k+ downloads, 170+ citations), responsible for core architecture, API design, 20+ releases, and review and integration of contributions from 90+ contributors.		
• Designed and implemented a modular, two-step application API for error-mitigation techniques, informed by user interviews, making mitigation circuits and experimental overhead explicit and inspectable.		
• Delivered 10+ talks and tutorials at major conferences and research institutions (PyData, SciPy, IEEE QCE, QuSoft), accelerating adoption of <code>mitiq</code> by quantum software engineers and researchers.		
Software Developer	Overleaf	2017–2021
• Improved LATeX autocomplete using statistical analysis of 40,000 open-source documents, enhancing user experience for 300,000+ daily users.		
• Monitored and supported data migration from PostgreSQL to MongoDB.		
Summer Researcher	New York University	2016
• Used Python to numerically solve nonlinear Schrödinger equations modeling electromagnetic pulse propagation in nonlinear media.		
Summer Researcher	Yale University (PROSPECT Experiment)	2014 & 2015
• Built an optical simulation in C++ to optimize detector design and study light collection and uniformity.		
• Implemented pulse-shape discrimination techniques in Python to improve neutrino event selection.		

PUBLICATIONS

1. LaRose, R. et al. (Aug. 2022). Mitiq: A software package for error mitigation on noisy quantum computers. *Quantum* 6, p. 774. URL: <https://doi.org/10.22331/q-2022-08-11-774>.

2. McDonough, B. et al. (2022). "Automated quantum error mitigation based on probabilistic error reduction". In: *2022 IEEE/ACM Third International Workshop on Quantum Computing Software (QCS)*, pp. 83–93. arXiv: [2210.08611](https://arxiv.org/abs/2210.08611) [quant-ph].
3. Ashenfelter, J. et al. (2016). Background Radiation Measurements at High Power Research Reactors. *Nucl. Instrum. Meth.* A806, pp. 401–419. arXiv: [1506.03547](https://arxiv.org/abs/1506.03547) [physics.ins-det].
4. Ashenfelter, J. et al. (2015). Light Collection and Pulse-Shape Discrimination in Elongated Scintillator Cells for the PROSPECT Reactor Antineutrino Experiment. *JINST* 10.11, P11004. arXiv: [1508.06575](https://arxiv.org/abs/1508.06575) [physics.ins-det].

SERVICE

Graduate Student Mentor	University of Amsterdam	2025 & 2026
Graduate Student Mentor	University of Washington	2024 & 2025
IEEE QCE 2025 Workshop organizer	Quantum Software 2.1	2025
WERQSHOP Chair Organizer	https://werq.shop	2025
Quantum Computing Devroom Chair	FOSDEM	2025
SciPy 2025 Reviewer		2025
QED-C mentor		2023–2024
Equity, Diversity and Inclusion Committee	University of Waterloo; IQC	2021–2022
Strategic Plan Implementation Working Group	University of Waterloo	2021

CONTINUING EDUCATION

Advanced Representation Theory and Applications	University of Amsterdam (audit)	Feb–Mar 2026
Advanced Quantum Algorithms	University of Amsterdam (audit)	Feb–Mar 2026
Hands-on quantum error correction with Google Quantum AI	Coursera	Feb 2026
CSE 599C: Quantum Learning Theory	University of Washington (audit)	Jan–Mar 2025
CSE 534: Quantum info. and computation	University of Washington (audit)	Sep–Dec 2024
Quantum Machine Learning Workshop	QSciTech-QuantumBC	Jan–Feb 2022
Presenting Data and Information	Edward Tufte	Nov 2019

TOOLS

Languages

- Python, JavaScript, SQL, Ruby, bash

Software

- git/GitHub, docker, Linux, MacOS, L^AT_EX

Quantum

- SDKs: Cirq, Qiskit, pyQuil, Qibo