

Caleb Rotello

GRADUATE RESEARCH ASSISTANT · QUANTUM ERROR MITIGATION

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Education

Colorado School of Mines

M.S. IN QUANTUM ENGINEERING

Golden, Colorado

May 2021 - Aug. 2022

- Thesis title: *Symmetry Protected Subspaces in Quantum Simulations*
- Advisor: Dr. Eliot Kapit, Associate Professor
- 4.0 GPA

Colorado School of Mines

B.S. IN COMPUTER SCIENCE

Golden, Colorado

Aug. 2018 - May 2021

- 3.78 GPA, 4.0 Major GPA

Skills

Quantum Computing

VQE, QAOA, RFQA, Quantum Simulations, Adiabatic Theorem, Perturbation Theory

Classical Computing

Finite Automata, Lexical Analysis, AST, Simulated Annealing, Dynamic Programming

Programming Languages

Quantum Gate Model, C++, Python, OCaml, R, Matlab, Mathematica

Software

Cirq, Lex, Yacc, Git, LaTeX

Hardware

7K Cryostat, SQUID, Clean Room, Photolithography, Evaporator, VNA Calibration & Measurement

Work Experience

National Renewable Energy Laboratory

QUANTUM COMPUTING ERROR MITIGATION INTERN

Golden, Colorado

Nov. 2021 - Present

- Discovered an algorithm to identify a class of symmetry in quantum systems
- Implemented discoveries for quantum post-selection
- Wrote quantum circuit simulation software for verification
- Collaborated with researchers across disciplines

Colorado School of Mines

GRADUATE RESEARCH ASSISTANT

Golden, Colorado

May 2021 - Present

- Wrote and successfully defended a thesis
- Implemented novel quantum optimization algorithms
- Submitted quantum code to Quantum AI's Sycamore processor
- Worked with other students to design quantum algorithms

Invitae

BIOINFORMATICS INTERN

Boulder, Colorado

May 2021 - Aug. 2021

- Created analysis code for research on acute myeloid leukemia
- Implemented software to pair RNA alpha and beta sequences across multiple cells
- Met with biologists and machine learning experts to develop technical goals
- Wrote and refactored R and Python code

ArcherDX

RESEARCH & DEVELOPMENT SOFTWARE INTERN

Boulder, Colorado

May 2020 - Aug. 2020

- Wrote and implemented novel algorithms to efficiently detect DNA sample errors
- Contributed to AMP chemistry analysis software for cancer genomics
- Wrote and refactored C++ and Python code
- Worked on a Scrum team

Contracting with County Police Departments

HEALTH & WELLNESS APP DEVELOPER

Denver, Colorado

Jun. 2019 - Dev. 2019

- App development in XCode
- Wrote secure API calls to AWS Lambda
- Developed application backend to securely handle personal information
- Worked with non-technical professionals to determine development goals

Valor Christian High School

IT INTERN

- Planned projects and supervised interns
- Administration of 640 Apple devices, from hardware maintenance to software deployment
- Directed setup and maintenance with Aerohive wireless access points
- Resolved user and helpdesk tickets

Highlands Ranch, Colorado

Dec. 2017 - Dec. 2018

Extracurricular Activity

Boy Scouts of America

EAGLE SCOUT

- Created, planned, and led an Eagle Scout service project
- Was an elected leader of a scout-led troop

Colorado

Jan. 2011 - Dec. 2018

Creative Writing Club

VICE PRESIDENT

- Organized biweekly meetings with students
- Planned writing exercises

Colorado School of Mines

Sep. 2021 - May 2022

High Grade Art Journal

POETRY EDITOR

- Participated in jury sessions for submitted writing
- Helped create final journal order

Colorado School of Mines

2022 Edition

Honors & Awards

2020 **4th Place**, HackCU VI Hackathon

2019 **Semifinalist**, RASC-AL

CU Boulder

NASA