ANGUS LOWE

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EDUCATION

Massachusetts Institute of Technology September 2022 -
PhD in Physics

University of Waterloo January 2020 - October 2021
MMath in Combinatorics and Optimization (Quantum Information)
Thesis advisor: Ashwin Nayak
Thesis title: *Learning Quantum States Without Entangled Measurements*

University of Edinburgh September 2015 - July 2019
BSc in Hons. Computer Science and Physics, First Class

RESEARCH INTERESTS

Quantum computing, learning theory, quantum complexity, quantum algorithms.

EXPERIENCE

Xanadu, Toronto, Canada October 2021 - August 2022
Quantum Applications Scientist

· Current research topic: Trading classical and quantum computation for NISQ devices

Fujitsu Research of America, Sunnyvale, California January 2021 - March 2021
Research Intern

· Research topic: Coresets for quantum machine learning

Los Alamos National Laboratory, Los Alamos, USA June 2020 - August 2020
Quantum Computing Summer School Fellow

· Research topic 1: Error mitigation with Clifford quantum circuit data
· Research topic 2: Adaptive optimizers for variational quantum algorithms

Xanadu, Toronto, Canada September 2019 - December 2019
Research Intern

· Research topic: Combining classical and quantum tensor networks for generative modelling

Perimeter Institute, Waterloo, Canada May 2018 - August 2018
Undergraduate Researcher

· Research topic: Generalized Bell inequalities to characterize non-local correlations in measurement scenarios

J.P. Morgan, Glasgow, UK June 2017 - August 2017
Software Engineer Intern

PUBLICATIONS

Master's Thesis

Learning quantum states without entangled measurements — October 2021
Advisor: Ashwin Nayak
Available at: https://uwspace.uwaterloo.ca/handle/10012/17663

Preprints

Fast quantum circuit cutting with randomized measurements — August 2022
Angus Lowe, Matija Medvidović, Anthony Hayes, Lee J. LJ O'Riordan, Thomas R. Bromley, Juan Miguel Arazzola
Available at: https://arxiv.org/abs/2207.14734

Lower bounds for learning quantum states with single-copy measurements — October 2021
Angus Lowe, Ashwin Nayak
Quantum Information Processing (QIP) 2022

Adaptive shot allocation for fast convergence in variational quantum algorithms — August 2021
Andi Gu, Angus Lowe, Pavel A. Dub, Patrick J. Coles, Andrew Arrasmith
Available at: https://arxiv.org/abs/2108.10434
Quantum Techniques in Machine Learning (QTML) 2021

Journal articles

Simulating key properties of lithium-ion batteries with a fault-tolerant quantum computer — August 2022
Alain Delgado et al.
Physical Review A Vol. 106, Iss. 3

Unified approach to data-driven quantum error mitigation — July 2021
Angus Lowe, Max Hunter Gordon, Piotr Czarnik, Andrew Arrasmith, Patrick J. Coles, Lukasz Cincio
Physical Review Research Vol. 3, Iss. 3

First principles study of dense and metallic nitric sulfur hydrides — April 2021
Xiaofeng Li, Angus Lowe, Lewis Conway, Maosheng Miao, Andreas Hermann
Communications Chemistry 4, 83 (2021).

TALKS

Lower bounds for learning quantum states with single-copy measurements
Quantum Information Processing (QIP) 2022 — March 2022

An overview of Shor's algorithm
Workshop for National Research Council Canada and Communications Security Establishment, Toronto, Canada — December 2021

Learning quantum states without entangled measurements
Master's thesis presentation, University of Waterloo, Waterloo, Canada — October 2021

Characterizing local correlations in the triangle scenario with linear programming
Quantum Information, Computing, and Control Summer School, Leeds, UK — August 2019
AWE Undergraduate Research Conference, Reading, UK — October 2018
Perimeter Institute, Waterloo, Canada — August 2018

Quantum key distribution explained
Famelab Science Communication Competition, Edinburgh, UK — February 2019

AWARDS AND HONORS

Waterloo Math Graduate Scholarship	January 2020
Famelab Science Communication Competition - Scottish Finalist	February 2019
British Association Research Travel Scholarship	May 2018
ERASMUS Grant and Exchange	May 2017
The Telegraph UK STEM Awards - Energy Category Finalist	March 2017

TEACHING

University of Waterloo

TA for CO 250: Introduction to Optimization	Spring 2021
TA for CO 255: Introduction to Optimization (Advanced Level)	Fall 2020
TA for CO 370: Deterministic Operational Research Models	Fall 2020
TA for MATH 136: Linear Algebra I	Winter 2020

University of Edinburgh

Physics Peer Mentor: E&M, Thermodynamics	Sept. 2018 - June 2019

VOLUNTEER & EXTRA-CURRICULAR

Volunteer math tutor at Regent Park Community Health Centre	Sept. 2021 - Aug. 2022
Deputy editor for Edinburgh University Science Magazine	Sept. 2018 - May 2019
Alto saxophone player for NTU Jazz Orchestra	Sept. 2017 - May 2019
Head of computer science for Edinburgh Young Scientific Researchers	Sept. 2016 - May 2017
Volunteer rugby coach at Toronto Inner-City Rugby Foundation	Sept. 2014 - June 2015