

Thomas Propson

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EDUCATION

University of Chicago

2017-2021

B.S. Physics, Computer Science

GPA: 3.89 / 4.0

RESEARCH EXPERIENCE

Experimental Control of Superconducting Qubits

2019-Present

University of Chicago Department of Physics, Advisor: David I. Schuster

- Perform spectroscopy, control, and readout on superconducting qubits
- Develop numerical techniques using control theory and trajectory optimization to engineer high fidelity quantum gates in the presence of decoherence and systematic errors

Quantum Hardware and Algorithm Optimization

2018-2019

University of Chicago Department of Computer Science, Advisor: Frederic T. Chong

- Developed a method for compiling variational quantum algorithms that achieves a 30x latency reduction
- Developed an operation scheduling algorithm for frequency-tunable qubits that mitigates cross-talk
- Investigated properties of near-term quantum hardware and algorithms to optimize quantum architectures for fidelity and latency

Hyperparameter Optimization

2018

Argonne National Laboratory Division of Math and Computer Science

Advisors: Stefan Wild, Prasanna Balaprakash

- Developed a software package to evaluate hyperparameter optimization algorithms that exposes a novel search space definition system
- Deployed neural network experiments on high-performance computing infrastructure

PUBLICATIONS

1. **T. Propson**, B. Jackson, Z. Manchester, D. I. Schuster, "Robust Control of a Fluxonium Qubit." In preparation (2020).
2. Y. Ding, P. Gokhale, S. F. Lin, R. Rines, **T. Propson**, F. T. Chong, "Systematic Crosstalk Mitigation for Superconducting Qubits via Frequency-Aware Compilation." Proceedings of the 53rd Annual IEEE/ACM International Symposium on Microarchitecture (2020). [[arxiv:2008.09503](https://arxiv.org/abs/2008.09503)]
3. P. Gokhale, Y. Ding, **T. Propson**, C. Winkler, N. Leung, Y. Shi, D. I. Schuster, H. Hoffmann, F. T. Chong, "Partial Compilation of Variational Algorithms for Noisy Intermediate-Scale Quantum Machines." [Proceedings of the 52nd Annual IEEE/ACM International Symposium on Microarchitecture](#), 266-278 (2019). [[arxiv:1909.07522](https://arxiv.org/abs/1909.07522)]

PATENTS

1. P. Gokhale, Y. Ding, **T. Propson**, F. T. Chong, "System and Method for Partial Compilation of Variational Algorithms in Quantum Computers." Pending.

HONORS AND AWARDS

Grainger Scholarship, Full-Tuition Senior Year, UChicago Physics	2020
Barry Goldwater Scholarship	2020
Enrico Fermi Scholar, Major GPA in top 5% from past 5 years, UChicago PSD	2020
Liew Family College Research Fellowship, UChicago	2018
Jeff Metcalf Research Fellowship, UChicago	2018
University Scholarship, UChicago	2017-2021

TALKS

- Commercial Outlook for Quantum Computing
University of Chicago, Booth School of Business, 2019
- Benchmarking Hyperparameter Optimization Algorithms on Deep Neural Networks
University of Chicago, Undergraduate Research Symposium, 2018
Argonne National Laboratory, Summer Student Symposium, 2018

SERVICE

- Uncommon Hacks** 2018-Present
- Technology Team Lead
- Organize an annual MLH endorsed hackathon to provide a platform for 300+ students to develop technical skills, collaborate with peers to create innovative projects, and network with employers
 - Lead a 10-person team of designers and software developers to build websites that reach 1000+ users

WORK EXPERIENCE

- PanorArt Inc.** 2018
- Full-Stack Web Developer
- Built front-end web components using Angular.js to provide users with a platform to buy and sell art that achieves greater price transparency than competing platforms
 - Improved online presence by implementing search engine optimization techniques
 - Implemented Node.js to handle server-client communication via HTTP as well as to manage relational and non-relational databases in order to ensure user data security and support mission-critical operations