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## EDUCATION

**The University of Chicago** 2017–2021  
B.A. Physics, Minor Computer Science  
GPA: 3.89 / 4.0

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## RESEARCH EXPERIENCE

**Experimental Control of Superconducting Qubits** 2019–Present

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

- Perform calibration, 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

The 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 by an order of magnitude
- 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

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## 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](#), 201-214 (2020). [[arxiv: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](#)]

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## 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

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Grainger Scholarship, UChicago Physics, full-tuition senior year	2020
Barry Goldwater Scholarship	2020
Enrico Fermi Scholar, UChicago PSD, major GPA in top 5% from past 5 years	2020
Summer Research Fellowship, UChicago	2019
Liew Family College Research Fellowship, UChicago	2018
Jeff Metcalf Research Fellowship, UChicago	2018
University Scholarship, UChicago	2017–2021

## CONTRIBUTED TALKS

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- Systematic Crosstalk Mitigation for Superconducting Qubits via Frequency-Aware Compilation
- MICRO 53 Conference (virtual), Athens, Greece, 2020
- Partial Compilation of Variational Algorithms for Noisy Intermediate-Scale Quantum Machines
- MICRO 52 Conference, Columbus, OH, 2019
- Commercial Outlook for Quantum Computing
- The University of Chicago Booth School of Business, Chicago, IL, 2019

## CONTRIBUTED POSTERS

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- Benchmarking Hyperparameter Optimization Algorithms on Deep Neural Networks
- The University of Chicago Undergraduate Research Symposium, Chicago, IL, 2018
  - Argonne National Laboratory Summer Student Symposium, Lemont, IL, 2018

## OUTREACH

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- The University of Chicago Department of Physics** 2020–Present
- Organize a pre-freshman, summer, physics program for first-generation and limited-income students
- Uncommon Hacks** 2018–Present
- Organize an annual MLH endorsed hackathon to provide a platform for 300+ students to collaborate with peers, learn technical skills, and develop relationships with employers
  - Lead a 10-person team of designers and software developers to build websites that reach 1000+ users
- Strive Learning** 2018
- Met weekly with students from limited-income households in the Chicago Public Schools to assist with coursework, college applications, and connecting students to extracurricular activities

## TEACHING

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- The University of Chicago**
- Grader, Winter 2020, CMSC 23300 Networks and Distributed Systems

## WORK EXPERIENCE

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- PanorArt Inc.** 2018
- Full-Stack Web Developer
- Developed a production server in Node.js to communicate with clients via HTTP and manage databases
  - Improved online presence by implementing search engine optimization techniques