Thomas Propson

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Education

B.S. University of Chicago — Chicago, IL
Physics, Computer Science — 2017 - 2021
GPA: 3.88 / 4.0

Research Experience

University of Chicago James Franck Institute — Chicago, IL
Schuster Lab, Advisor: David I. Schuster — June 2019 - Present

- Develop an open-source software package that performs quantum optimal control on open systems, and achieves experimental robustness
- Perform control, spectroscopy, and readout on superconducting qubits
- Assess and implement numerical analysis techniques to achieve efficient and accurate quantum system simulation

University of Chicago Department of Computer Science — Chicago, IL
Chong Lab, Advisor: Frederic Chong — October 2018 - June 2019

- Developed a compilation method for 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 architecture for fidelity and latency

Argonne National Laboratory — Lemont, IL
Laboratory of Applied Mathematics, Numerical Software, and Statistics, Advisors: Stefan Wild, Prasanna Balaprakash — June - August 2018

- 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

Partial Compilation of Variational Algorithms for Noisy Intermediate-Scale Quantum Machines October 2019

P. Gokhale, Y. Ding, T. Propson, C. Winkler, N. Leung, Y. Shi, D. I. Schuster, H. Hoffmann, F. T. Chong.

In Proc. of the 52nd Annual IEEE/ACM Intl. Symposium on Microarchitecture (MICRO)

Patents

System and Method for Partial Compilation of Variational Algorithms in Quantum Computers Pending

P. Gokhale, Y. Ding, T. Propson

Presentations

Commercial Outlook for Quantum Computing

- University of Chicago - Booth School of Business - Chicago, IL 2019

Benchmarking Hyperparameter Optimization Algorithms on Deep Neural Networks

- University of Chicago - Undergraduate Research Symposium - Chicago, IL 2018
- Argonne National Laboratory - Summer Argonne Student Symposium - Lemont, IL 2018

Awards & Honors

University of Chicago Summer Action Grant 2019

- Received funding to pursue research at the University of Chicago James Franck Institute

Liew Family College Research Fellowship 2018

- Received funding to pursue research at the University of Chicago Department of Computer Science

Jeff Metcalf Research Fellowship 2018

- Received funding to pursue research at Argonne National Laboratory

University of Chicago Dean's List 2018, 2019