

JOSHUA VISZLAI

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EDUCATION

Ph.D., University of Chicago (Expected Spring 2026) <i>Department of Computer Science</i> Thesis: Software/Hardware Co-Design of Fault-Tolerant Quantum Systems Advisor: Frederic T. Chong GPA: 4.0	Chicago, IL 2020 - Present
B.Sc., Georgia Institute of Technology <i>Computer Science (Systems & Architecture, Intelligence) w/ Physics Minor</i> Thesis: An Analysis of Register Allocation Techniques in the Context of a RISC-V Processor Advisor: Vivek Sarkar GPA: 4.0	Atlanta, GA 2016 - 2020

PROFESSIONAL EXPERIENCE

PhD Candidate, University of Chicago, Computer Science Dept. , 2020-Present	Chicago, IL
Quantum Error Correction Consultant, Inflection , 2025-Present	Chicago, IL
Undergraduate Researcher Georgia Tech, Computer Science Dept. , 2019-2020	Atlanta, GA
Software Engineering Intern, Microsoft, Visual Studio , Summer 2019, 2020	Redmond, WA
Undergraduate Researcher Georgia Tech, Computer Science Dept. , Fall 2018	Atlanta, GA

AWARDS AND HONORS

Best Poster Honorable Mention , International Conference on Quantum Error Correction for <i>Erasure Minesweeper</i> with Chadwick, Teo, Yang, and Chong	2025
Best Paper (Systems 1st Place) , Intl. Conference on Quantum Computing and Engineering for <i>Averting multi-qubit burst errors in surface code magic state factories</i> with Chadwick et al.	2024
IEEE Micro Top Picks in Computer Architecture of 2022, Honorable Mention for <i>SupermarQ: A Scalable Quantum Benchmark Suite</i> with Tomesh et al.	2023
Best Paper , International Symposium on High-Performance Computer Architecture for <i>SupermarQ: A Scalable Quantum Benchmark Suite</i> with Tomesh et al.	2022
Crerar Fellowship University of Chicago	2020-2021
Graduated with Highest Honors Georgia Institute of Technology	2020
Zell Miller Scholarship (Full Tuition) Georgia Institute of Technology	2016-2020

REFEREED PUBLICATIONS

1. **decoder-bench: Benchmarking Decoders for Quantum Error Correction** October 2025
S. Maurya, J. Viszlai, N. Raveendran, P. Das, S. Tannu
in *IEEE International Symposium on Workload Characterization (IISWC)*

2. **Matching Generalized-Bicycle Codes to Neutral Atoms for Low-Overhead Fault-Tolerance** September 2025
J. Vízslai, W. Yang, S. F. Lin, J. Liu, N. Nottingham, J. M. Baker, F. T. Chong
in *IEEE International Conference on Quantum Computing and Engineering (QCE)*
3. **Erasure Minesweeper: exploring hybrid-erasure surface code architectures for efficient quantum error correction** September 2025
J. D. Chadwick, M. H. Teo, J. Vízslai, W. Yang, F. T. Chong
in *IEEE International Conference on Quantum Computing and Engineering (QCE)*
4. **SWIPER: Minimizing Fault-Tolerant Quantum Program Latency via Speculative Window Decoding** June 2025
J. Vízslai, J. D. Chadwick, S. Joshi, G. S. Ravi, Y. Li, F. T. Chong
in *International Symposium on Computer Architecture (ISCA)*
5. **Interleaved Logical Qubits in Atom Arrays** March 2025
J. Vízslai, S. F. Lin, S. Dangwal, C. Bradley, V. Ramesh, J. M. Baker, H. Bernien, F. T. Chong
in *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*
6. **Averting multi-qubit burst errors in surface code magic state factories** September 2024
J. D. Chadwick, C. Kang, J. Vízslai, S. F. Lin, F. T. Chong
in *IEEE International Conference on Quantum Computing and Engineering (QCE)*
Best Paper Award: 1st Place Quantum Systems Software
7. **Codesign of quantum error-correcting codes and modular chiplets in the presence of defects** April 2024
S. F. Lin, J. Vízslai, K. N. Smith, G. S. Ravi, C. Yuan, F. T. Chong, B. J. Brown
in *ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*
8. **Fast Fingerprinting of Cloud-based NISQ Quantum Computers** May 2023
K. N. Smith, J. Vízslai, L. M. Seifert, J. M. Baker, J. Szefer, F. T. Chong
in *IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*
9. **Training Quantum Boltzmann Machines with Coresets** September 2022
J. Vízslai, T. Tomesh, P. Gokhale, E. Anschuetz, F. T. Chong
in *IEEE International Conference on Quantum Computing and Engineering (QCE)*
10. **SupermarQ: A Scalable Quantum Benchmark Suite** April 2022
T. Tomesh, P. Gokhale, V. Omole, G. S. Ravi, K. Smith, J. Vízslai, X.-C. Wu, N. Hardavellas, M. R. Martonosi, F. T. Chong
in *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*
Best Paper Award, IEEE Micro Top Picks Honorable Mention
11. **Adapting Quantum Approximation Optimization Algorithm (QAOA) for Unit Commitment** October 2021
S. Koretsky, P. Gokhale, J. M. Baker, J. Vízslai, H. Zheng, N. Gurung, R. Burg, E. A. Paaso, A. Khodaei, R. Eskandarpour, F. T. Chong
in *IEEE International Conference on Quantum Computing and Engineering (QCE)*

UNDER REVIEW

1. **qSIEVE: Efficient qLDPC Memory via Systolic Movement in Atom Arrays**
J. Vízslai, W. Yang, S. F. Lin, J. Liu, N. Nottingham, J. M. Baker, F. T. Chong
2. **Propagation-Aware Compilation of Syndrome Measurement Circuits**
J. Vízslai, S. Maurya, S. Tannu, M. Martonosi, F. T. Chong

OTHER ARTICLES

1. **Racing Camels in a Quantum Game of Camel Up** June 2025
ACM SIGARCH Blog with F. T. Chong
2. **5 Year Update to the Next Steps in Quantum Computing** January 2024
K. Brown, F. T. Chong, K. N. Smith, T. Conte, A. Adams, A. Dalvi, C. Kang, J. Visslai

TEACHING

- Co-Instructor:** Quantum Computer Systems (CMSC 229/329) Spring '23, Spring '25
Computer Science Department, **University of Chicago**, (with F. T. Chong)
- Teaching Assistant and Course Manager:** Quantum Computer Systems Design 2021-Present
MOOC on edX, **University of Chicago**
- Teaching Assistant:** Computer Architecture (CMSC 222) Fall '22
Computer Science Department, **University of Chicago**
- Teaching Assistant:** Quantum Computer Systems (CMSC 229/329) Spring '22
Computer Science Department, **University of Chicago**
- Instructor:** Software Engineering Major, Video Game Development Minor Summer '21
Georgia Governor's Honors Program
- Head Teaching Assistant:** Computer Organization and Programming (CS 2110) 2019-2020
Computer Science Department, **Georgia Institute of Technology**
- Teaching Assistant:** Computer Organization and Programming (CS 2110) 2018-2019
Computer Science Department, **Georgia Institute of Technology**

INVITED TALKS

1. **Enabling Programming Abstractions for More Effective Quantum Development** September 2025
Invited panelist at **QCE '25** workshop Albuquerque, NM
2. **Device-aware Quantum Software** September 2025
Invited speaker and panelist at **QCE '25** workshop Albuquerque, NM
3. **Decoding the Performance Gap: Propagation-Aware Compilation of Stabilizer Circuits** June 2025
Workshop talk at Workshop on Fault-Tolerant Quantum Computer System Architecture (FTQCSA) Tokyo, Japan
4. **Speculative Window Decoding for Fault-Tolerant Quantum Programs** June, April, February 2025
 - Conference talk at **ISCA '25** Tokyo, Japan
 - Invited talk at **Northwestern University** Chicago, IL
 - Seminar talk at HQAN Research Coordination Talks Chicago, IL
5. **Interleaved Logical Qubits in Atom Arrays** March 2025
Conference talk at **HPCA '25** Las Vegas, NV
6. **Entangling Codes with Hardware: Reducing the Cost of Fault-Tolerance via Co-Design** March 2025
Invited keynote speaker and panelist for Workshop on Architecting Error Corrected Quantum Computers (ARQTEC) Las Vegas, NV
7. **Simulating Generalized-Bicycle Codes for Atom Arrays** September 2025, January 2024
 - Conference talk at **QCE '25** Albuquerque, NM

- Invited talk at Inflection Chicago, IL
8. **Training Quantum Boltzmann Machines with Coresets** September 2022
Conference talk at **QCE '22** Broomfield, CO

OTHER TALKS AND PRESENTATIONS

1. **Speculative Window Decoding for Fault-Tolerant Quantum Programs** April, March 2025
 - Talk at UChicago's Quantum Information Science and Engineering Seminar Chicago, IL
 - Talk at APS Global Physics Summit Anaheim, CA
2. **Introduction to Quantum Error Correction** June 2024
Tutorial talk at I too can Quantum! (I2Q) Buenos Aires, Argentina
3. **Simulating Generalized Bicycle Codes for Atom Arrays** March, February 2024
 - Talk at APS March Meeting Minneapolis, MN
 - Talk at UChicago's Quantum Information Science and Engineering Seminar Chicago, IL
4. **Quantum Error Correction and Graph Processing for Decoding** June 2023
Tutorial talk at I too can Quantum! (I2Q) Orlando, FL
5. **Evaluating Surface Code Schemes for Neutral Atom Devices** March 2023
Talk at APS March Meeting Las Vegas, NV

PROFESSIONAL SERVICE

Organizer:

- I too can Quantum! at ISCA 2023, 2024

Conference Committees:

- IEEE International Symposium on High-Performance Computer Architecture (HPCA) 2026
- IEEE International Conference on Quantum Computing and Engineering (QCE) 2024, 2025

Journal Refereeing:

- Physical Review X Quantum (PRX Quantum)
- Nature Partner Journals (npj Quantum Information)

OPEN-SOURCE SOFTWARE

- **qLDPCOrg/qLDPC** 2025-Present
Broad circuit-level simulation support for quantum error correcting codes
- **jviszlai/swiper** 2025-Present
Round-level windowed decoding simulator for lattice surgery programs

COMMUNITY OUTREACH

- **Science Works at Griffin Museum of Science and Industry** October 2024
Engaged with community members at UChicago CANON Lab station Chicago, IL
- **Peter & Judy Kovler Career Conference for High School Students** June 2023
Panelist and networking lunch participant Chicago, IL
- **South Side Science Festival** September 2022
Engaged with community members at UChicago CANON Lab station Chicago, IL

- **RoboJackets Outreach** 2016-2020
Organized community volunteering and mentorship for K-12 students Atlanta, GA
- **Georgia FIRST Robotics** 2016-Present
FRC event volunteer Georgia
- **Georgia Governor's Honors Program** 2018-Present
Computer Science application reviewer and interviewer Georgia