Amanda Xu

Computer Sciences, UW–Madison
1205 University Ave, Madison, WI 53706

amandax@cs.wisc.edu
amandashoe.github.io

EDUCATION

University of Wisconsin–Madison, Madison, WI.
Ph.D. in Computer Science August 2021–May 2026 (expected)
M.S. in Computer Science August 2021–May 2023
Advisor: Aws Albarghouthi.

Cornell University, Ithaca, NY.
B.S. in Computer Science August 2017–May 2020

PUBLICATIONS

Generating Compilers for Qubit Mapping and Routing. POPL 2026
Abtin Molavi, **Amanda Xu**, Ethan Cecchetti, Swamit Tannu, Aws Albarghouthi.

Reducing T Gates with Unitary Synthesis. ASPLOS 2026
Tianyi Hao, **Amanda Xu**, Swamit Tannu.

Optimizing Quantum Circuits, Fast and Slow. ASPLOS 2025
Amanda Xu, Abtin Molavi, Swamit Tannu, Aws Albarghouthi.

Checking Observational Correctness of Database Systems. OOPSLA 2025
Lauren Pick, **Amanda Xu**, Ankush Desai, Sanjit A. Seshia, Aws Albarghouthi.

Dependency-Aware Compilation for Surface Code Quantum Architectures. OOPSLA 2025
Abtin Molavi, **Amanda Xu**, Swamit Tannu, Aws Albarghouthi.

Synthesizing Quantum-Circuit Optimizers. PLDI 2023
Amanda Xu, Abtin Molavi, Lauren Pick, Swamit Tannu, and Aws Albarghouthi.

Qubit Mapping and Routing via MaxSAT. MICRO 2022
Abtin Molavi, **Amanda Xu**, Martin Diges, Lauren Pick, Swamit Tannu, Aws Albarghouthi.

Petr4: Formal Foundations for P4 Data Planes. POPL 2021
Ryan Doenges, Mina Tahmasbi Arashloo, Santiago Bautista, Alexander Chang, Newton Ni, Samwise Parkinson, Rudy Peterson, Alaia Solko-Breslin, **Amanda Xu**, and Nate Foster.

HONORS AND AWARDS

ACM SIGPLAN John Vlissides Award 2025
Rising Stars in EECS 2025
Cisco Systems Distinguished Graduate Fellowship 2025–2026
UW–Madison CS Golden Brick Service Award 2023
Cornell CIS TA Award (2x) 2019
Cornell Tradition Fellow 2017–2020

PREPRINTS AND PEER-REVIEWED WORKSHOP PAPERS

How to Synthesize Quantum-Circuit Optimizers SPLASH 2025
Amanda Xu

*The **FL**uid **A**llocation of **S**urface code **Q**ubits (FLASQ) cost model for early fault-tolerant quantum algorithms.* arXiv: 2511.08508, 2025
William J. Huggins, Tanuj Khattar, **Amanda Xu**, Matthew Harrigan, Christopher Kang, Guang Hao Low, Austin Fowler, Nicholas C. Rubin, Ryan Babbush.

TEACHING EXPERIENCE

University of Wisconsin–Madison, Madison, WI.

CS 639: Systems Architecture for Quantum Computers Spring 2025
Teaching assistant for Prof. Swamit Tannu. Class size: 42.

CS 200: Programming I Fall 2021
Teaching assistant for Prof. Jim Williams. Class size: 801.

Cornell University, Ithaca, NY.

CS 4160: Formal Verification Spring 2020
Teaching assistant for Prof. Michael Clarkson. Class size: 54.

CS 3110: Data Structures and Functional Programming Spring 2019–Fall 2019
Consultant (Head in Fall) for Profs. Nate Foster and Michael Clarkson. Class size: 350.

CS 1110: Introduction to Computing Using Python Fall 2018
Consultant for Prof. Walker White. Class size: 688.

TALKS AND GUEST LECTURES

SPLASH Doctoral Symposium — Singapore, October 2025
University of California, Santa Cruz — Virtual, May 2025
UW–Madison CS 703: Program Verification and Synthesis — Madison, WI, April 2025
UW–Madison CS 838: Quantum Computing Seminar — Madison, WI, March 2025
APS March Meeting — Anaheim, CA, March 2025
Lawrence Berkeley National Laboratory — Virtual, April 2024
APS March Meeting — Minneapolis, MN, March 2024
Amazon Web Services, Braket — Virtual, July 2023

TUTORIALS

Compiling Quantum Circuits — ASPLOS 2025, SPLASH 2025

INDUSTRIAL EXPERIENCE

Google, Venice, CA

Student Researcher, Quantum AI May 2025–present

- Implemented the first automated compiler from architecture-agnostic logical circuits to architecture-constrained error correction primitives, bridging a major gap towards extracting physical circuits executable on hardware.
- Designed an intermediate representation for expressing and automatically validating mapping and routing solutions, providing quantum algorithms researchers an alternative to underspecified, hand-drawn diagrams with no constructive proof of correctness.

Amazon Web Services, East Palo Alto, CA
Applied Scientist Intern, Database Systems Lab May–September 2023

- Improved the performance of a database correctness checker used to audit logs for isolation level and SQL violations.
- Discovered two new bugs in an internal database under development, after designing and executing an extensive experimental evaluation for the checker.

Amazon Web Services, New York, NY
Software Development Engineer, Fraud Prevention May 2020–August 2021

- Launched a secure upload service for AWS customers to submit verification documents for fraud investigations.
- Overhauled a production Django tool, significantly improving performance and reliability for internal fraud investigators.

American Express, New York, NY
Software Engineering Intern, B2B Payments June–August 2019

- Architected, implemented, and deployed a full-stack voice assistant backed by word2vec.

SERVICE

ASPLOS 2026 External Review Committee Member	2025
Quantum Journal Reviewer	2025
Transactions on Quantum Engineering Journal Reviewer	2025
OOPSLA 2025 External Reviewer	2025
PLDI 2025 Artifact Evaluation Committee Member	2025
OOPSLA 2024 Artifact Evaluation Committee Member	2024

UW–Madison Chapter of ACM-W (WACM) Mentoring Program Co-Chair	2022–present
UW–Madison CS Graduate Student Advisory Board Member	2024–2025
UW–Madison M.S. in Data Science Application Screener	2024
madPL Seminar Organizer	Fall 2024
madPL Website Maintainer	2023–present
Women in Computing at Cornell (WICC) General Volunteer	2018–2019

MENTORING

Undergraduate Research Advisor	2024–present
ACM SIGPLAN Long-Term Mentoring Committee (SIGPLAN-M) Mentor	2025–present
UW–Madison Chapter of ACM-W (WACM) Mentor	2021–2025
Amazon Web Services Summer Intern Host	2020
Just About Music Program House Resident Assistant	2019–2020

TRAVEL FUNDING

ASPLOS	2025
Grace Hopper Conference	2024
MICRO	2022
PLMW at POPL	2022

REFERENCES

Aws Albarghouthi
Department of Computer Sciences
University of Wisconsin–Madison
aws@cs.wisc.edu

Jens Palsberg
Department of Computer Science
University of California, Los Angeles
palsberg@cs.ucla.edu

Thomas Reps
Department of Computer Sciences
University of Wisconsin–Madison
reps@cs.wisc.edu

Matthew Harrigan
Quantum AI
Google
mpharrigan@google.com

Swamit Tannu
Department of Computer Sciences
University of Wisconsin–Madison
swamit@cs.wisc.edu