

Abtin Molavi

Computer Sciences

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EDUCATION	University of Wisconsin–Madison, Ph.D. in Computer Sciences Advisor: Aws Albarghouthi	2021-
	University of Wisconsin–Madison, M.S. in Computer Sciences	2021-2023
	Harvey Mudd College, B.S. in Computer Science and Math Graduated with high distinction	2017-2021
POSITIONS	Applied Scientist Intern, Amazon Web Services Developed a system for automatically inferring invariants of distributed systems from simulated and actual execution traces, helping uncover divergences between models and implementations.	2023
PUBLICATIONS	Satvik Maurya, Abtin Molavi , Aws Albarghouthi, Swamit Tannu. “A Case for Elastic Quantum Error Correction Decoders” <i>Proceedings of Twenty-First European Conference on Computer Systems</i> (EuroSys 2026).	
	Abtin Molavi , Amanda Xu, Ethan Cecchetti Swamit Tannu, Aws Albarghouthi. “Generating Compilers for Qubit Mapping and Routing” <i>Proceedings of the ACM on Programming Languages</i> , Volume 10, POPL. (POPL 2026).	
	Abtin Molavi , Amanda Xu, Swamit Tannu, Aws Albarghouthi. “Dependency-aware Compilation for Surface Code Quantum Architectures” <i>Proceedings of the ACM on Programming Languages</i> , Volume 9, OOPSLA. (OOPSLA 2025).	
	Amanda Xu, Abtin Molavi , Lauren Pick, Swamit Tannu, Aws Albarghouthi. “Optimizing Quantum Circuits, Fast and Slow” <i>Proceedings of the 30th ACM International Conference on Architectural Support for Programming Languages and Operating Systems</i> (ASPLOS 2025).	
	Amanda Xu, Abtin Molavi , Lauren Pick, Swamit Tannu, Aws Albarghouthi. “Synthesizing Quantum-Circuit Optimizers” <i>Proceedings of the 44th ACM SIGPLAN Conference on Programming Language Design and Implementation</i> (PLDI 2023).	
	Abtin Molavi , Amanda Xu, Martin Diges, Lauren Pick, Swamit Tannu, Aws Albarghouthi. “Qubit Mapping and Routing via MaxSAT.” <i>Proceedings of the 55th IEEE/ACM International Symposium on Microarchitecture</i> (MICRO 2022).	
	Abtin Molavi , Thomas Schneider, Mara Downing, Lucas Bang. “MCBAT: Model Counting for Constraints over Bounded Integer Arrays.” <i>Proceedings of the 12th Working Conference on Verified Software: Theories, Tools, and Experiments</i> (VSTTE 2020).	
	Abtin Molavi , Mara Downing, Thomas Schneider, Lucas Bang. “MCBAT: A Practical Tool for Model Counting Constraints on Bounded Integer Arrays.” <i>Proceedings of the 2020 ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering</i> (ESEC/FSE 2020).	

Mara Downing, **Abtin Molavi**, Lucas Bang. “Symbolic Execution + Model-Counting + Entropy Maximization = Automatic Search Synthesis.” *Proceedings of the 11th International Symposium on Games, Automata, Logics, and Formal Verification* (GandALF 2020).

SOFTWARE	SATMAP , A MaxSAT-based qubit mapping and routing tool Publicly available at https://github.com/qqq-wisc/satmap Implements the algorithm described in our MICRO '22 paper.	
	WISQ , A powerful and flexible compiler for quantum circuits Publicly available at https://github.com/qqq-wisc/wisq Integrates the algorithms from our ASPLOS '25 and OOPSLA '25 papers	
INVITED TALKS	<i>Qubit Mapping and Routing for an Evolving Quantum Hardware Landscape</i> TUM Chair for Design Automation	January 2026
	<i>Generating Compilers for Qubit Mapping and Routing</i> Unitary Foundation Quantum Wednesday	November 2025
	<i>Qubit Mapping and Routing for an Evolving Quantum Hardware Landscape</i> UCSC Languages, Systems, and Data Seminar	May 2025
TUTORIALS	<i>Compiling Quantum Circuits</i> With Amanda Xu, Swamit Tannu, and Aws Albarghouthi	ASPLOS 2025, SPLASH 2025
SERVICE	OOPSLA 2026 , Artifact Evaluation Committee ASPLOS 2026 , External Review Committee OOPSLA 2025 , External Reviewer ACM Transactions on Quantum Computing (2023), Reviewer	
AWARDS AND HONORS	NSF Graduate Research Fellowship Program Honorable Mention CRA Outstanding Undergraduate Researcher Award Finalist Harvey Mudd College CS Department Don Chamberlin Research Award	2022 2021 2021
TEACHING EXPERIENCE	Teaching Assistant , University of Wisconsin-Madison CS 240: Discrete Mathematics	Fall 2021
	Grader and Tutor , Harvey Mudd College CS 131: Programming Languages Math 171: Abstract Algebra Math 131: Real Analysis CS 81: Computability and Logic CS 60: Principles of Computer Science	Fall 2020, Spring 2021 Fall 2020 Fall 2019 Fall 2019 Spring 2019