

# Austin Adams

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## Research Interests

Quantum compilers, quantum programming languages, and quantum education

## Education

- August 2022 – **Ph.D. Student in Computer Science, Georgia Institute of Technology, Atlanta, GA**
- December 2026 (expected) ○ Advisors: Prof. Thomas M. Conte and Dr. Jeffrey S. Young  
○ Thesis topic: Design, implementation, and applications of a basis-oriented quantum programming language
- August 2020 – **Master of Science in Computer Science, Georgia Institute of Technology, Atlanta, GA**
- May 2022 ○ Master's thesis: *Enabling a Programming Environment for an Experimental Ion Trap Quantum Testbed*  
○ Contributed to the XACC and QCOR open-source quantum compiler projects, including creating an optimizing compiler backend for an ion trap quantum testbed at Georgia Tech Research Institute
- August 2016 – **Bachelor of Science in Computer Science, Georgia Institute of Technology, Atlanta, GA**
- December 2018 ○ Graduated with Highest Honor. GPA: 3.90/4.00  
○ Threads: Theory, Systems & Architecture

## Industry Experience

- May 2022 – **Research Intern, Microsoft**
- August 2022 ○ Implemented proof-of-concept *notebook mode* in the Q# compiler, which relaxes many fundamental language constraints and ignores Jupyter kernel meta-commands  
○ Presented and wrote a report about the path forward for canonizing notebook mode as an official part of the Q# specification and its impact on the overall Q# notebook architecture
- March 2019 – **Software Development Engineer, Amazon, Seattle, WA**
- November 2020 ○ Unblocked the launch of new countries and product categories by writing Apache Spark jobs to process huge raw database dumps, reducing the storage needed on service hosts by 100x  
○ Designed and implemented automated resolution of validation errors for changes to product financial classifications, allowing non-engineers to help handle the high volume of validation override requests

## Teaching Experience

- Spring 2025 **Instructor, CS 2110 (Computer Organization & Programming), Georgia Tech**  
○ 109 students, 38 TAs, 3.39 course GPA, 538 Piazza contributions
- Fall 2023 **Instructor, CS 2110 (Computer Organization & Programming), Georgia Tech**  
○ 277 students, 37 TAs, 3.44 course GPA, 1,617 Piazza contributions
- Spring 2022 **Head Teaching Assistant, CS 4290/6290 (High-Performance Computer Architecture), Georgia Tech**  
○ 103 students, managed 5 TAs, 496 Piazza contributions  
○ Rewrote projects for cache and superscalar CPU simulation from scratch
- Fall 2018 **Head Teaching Assistant, CS 2110 (Computer Organization & Programming), Georgia Tech**  
○ 360 students, managed 18 TAs, 1,060 Piazza contributions  
○ Overhauled autograding infrastructure for class, making class fully autograded for the first time

## Selected Publications

- September 2025 Austin J. Adams, Sharjeel Khan, Arjun S. Bhamra, Ryan R. Abusaada, Travis S. Humble, Jeffrey S. Young, and Thomas M. Conte. *Qwerty: A Basis-Oriented Quantum Programming Language*. In *2025 IEEE International Conference on Quantum Computing and Engineering (QCE '25)*. arXiv:2404.12603 [quant-ph].
- March 2025 Austin J. Adams, Sharjeel Khan, Arjun Bhamra, Ryan Abusaada, Anthony M. Cabrera, Cameron Hoechst, Jeffrey S. Young, and Thomas M. Conte. *ASDF: A Compiler for Qwerty, a Basis-Oriented Quantum Programming Language*. In *2025 International Symposium on Code Generation and Optimization (CGO '25)*.
- May 2023 Akihiro Hayashi, Austin J. Adams, Jeffrey Young, Alexander McCaskey, Eugene Dumitrescu, Vivek Sarkar, and Thomas M. Conte. *Enabling Multi-threading in Heterogeneous Quantum-Classical Programming Models*. 2023 Workshop on Quantum Computing Algorithms, Systems, and Applications (Co-located with IPDPS 2023).
- November 2021 Austin J. Adams, Elton Pinto, Jeff Young, Creston Herold, Alex McCaskey, Eugene Dumitrescu, and Thomas M. Conte. *Enabling a Programming Environment for an Experimental Ion Trap Quantum Testbed*. IEEE International Conference on Rebooting Computing (ICRC 2021).