Muye "Willers" Yang

Website: willersyang.com | Email: willers.yang@ibm.com | US Permanent Resident

Massachusetts Institute of Technology | Bachelor of Science, 4.8/5   08/2018 – 06/2022

Major in **Mathematics with Computer Science** and in **Physics,** Minor in **Statistics** (Refer to my website for a list of courses)

Research Refer to my website (willersyang.com/projects) for details

Quantum Computing Researcher | IBM | Cambridge, MA   08/2022 – Present
- Work with the theory group to develop novel circuit synthesis algorithms and quantum compilation techniques
- Helped to develop the state-of-the-art methods for Clifford synthesis in two connectivity models, resulting in a pending patent (P202203595) and a paper (CNOT circuits need little help to implement arbitrary Hadamard-free Clifford transformations they generate) submitted for review at NPJ Quantum Information
- Contributed to the development of Qiskit compiler by implementing Clifford synthesis algorithms

Research in Industrial Projects for Students (RIPS) | IPAM, UCLA | Los Angeles, CA   06/2021 – 08/2021
- Collaborated with a team of 4 researchers on a quantum computing project as the project manager
- Improved upon the best-known circuit construction of multiple-controlled-Toffoli gates when ancillary qubits are limited (to be integrated to Qiskit)
- Began the study of relative-phase Toffoli gates with the first set of bounds and optimality proofs
- Presented at AMS Contributed Paper Session on Quantum Theory during the JMM conference in April, 2022

Undergraduate Researcher | Research Laboratory for Electronics, MIT | Cambridge, MA   06/2020 – 06/2021
- Implemented a GPU-optimized numerical algorithm on Julia to look for counterexamples for the constrained minimum output conjecture in quantum communication theory
- Analyzed the algorithm outputs to confirm the conjecture

Undergraduate Researcher | Vogelsberger Group, MIT | Cambridge, MA   06/2019 – 12/2019
- Utilized Harvard's research computing cluster to study the properties of self-interacting dark matter with endothermic collisions via hydrodynamic simulations
- Worked with large datasets (80TB) and visualized results using Python

Service and Outreach

Education Researcher | MIT Scheller Teacher Education Program   06/2022 – 08/2022
- Designed equitable project-based-learning modules and assessments to improve high school curriculums
- Developed professional development tools for high school teachers

Outreach Director | dynaMIT   09/2018 – 06/2022
- Oversaw the design and co-directed the operation of a five-week-long STEM outreach program that welcomed more than 100 external underserved students and MIT mentors
- Advertised the program and oversaw the recruitment of MIT mentors and program participants

Emergency Medical Technician | MIT EMS   01/2020 – 06/2022
- Worked in high-stakes situations in teams to provide emergency medical transport to MIT and surrounding areas

Undergraduate TA | Introduction to Probability and Random Variables, Combinatorics   02/2021 – 12/2021
- Led problem solving sessions for students during class
- Held weekly office hours for homework help, exam prep and other questions related to the course

BOSTON PRE-RELEASE CENTER | Prison Tutor through Petey Greene Program   05/2019 – 03/2020
- Tutored incarcerated people weekly in subjects including math and science and a mentor
- Facilitated two of my students in obtaining their GED