Ji Liu

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EDUCATION

North Carolina State University (NCSU) Aug.2016 - Now
Ph.D. Major in Computer Engineering, ECE department
Advisor: Dr. Huiyang Zhou

University of Science and Technology of China (USTC) Sep.2012 - Jun.2016
B.S. Major in Applied Physics, School for the gifted young

RESEARCH INTERESTS

Computer Architecture, Quantum Computing, Compiler Optimization, Programming Language

PUBLICATIONS

[HPCA'21] Systematic Approaches for Precise and Approximate Quantum State Runtime Assertion
Ji Liu and Huiyang Zhou
IEEE International Symposium on High-Performance Computer Architecture (HPCA), Seoul, South Korea, 2021

[CGO'21] Relaxed Peephole Optimization: A Novel Compiler Optimization for Quantum Circuits
Ji Liu, Luciano Bello, and Huiyang Zhou
International Symposium on Code Generation and Optimization (CGO), co-located with HPCA, Seoul, South Korea, 2021

[IISWC'20] Reliability Modeling for NISQ-Era Quantum Computer
Ji Liu and Huiyang Zhou
IEEE International Symposium on Workload Characterization (IISWC), Beijing, China, 2020

[ASPLOS'20] Quantum Circuits for Dynamic Runtime Assertions in Quantum Computation
Ji Liu, Gregory T. Byrd, and Huiyang Zhou
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), Lausanne, Switzerland, 2020

[ICS'20] MKPipe:A Compiler Framework for Optimizing Multi-Kernel Workloads in OpenCL for FPGA
Ji Liu, Abdullah-Al Kafi, Xipeng Shen, and Huiyang Zhou
ACM International Conference on Supercomputing (ICS), Barcelona, Spain, 2020

US PATENT UNDER SUBMISSION

"Compilation of a Quantum Program" **Ji Liu,** Luciano Bello, Ali Javadi-Abhari, 2020

WORKING EXPERIENCE

IBM Quantum Summer Internship mentor: Dr. Luciano Bello Jun.2020 - Aug.2020

-Topology-Aware Gate Decomposition: Proposed gate decomposition methods based on backend topology.

-Multi-programming VQE Algorithm: Discovered an approach to accelerate solving for multiple VQE problems.

-Common Subcircuit Identification: Created common subcircuit identification for a set of circuits. The compilation time of a circuit set can be reduced by identifying the common subcircuits. We filed an US patent application based on this project.

University of Waterloo Summer Exchange Researcher mentor: Dr. Dayan Ban Jul.2015 - Aug.2015

-Built the optical circuit of a terahertz lazer system to analyze the structure of organic transistor materials.

TALKS & PRESENTATIONS

IISWC'20, IEEE International Symposium on Workload Characterization, Oct 2020

ICS'20, 34th ACM International Conference on Supercomputing, Jun 2020

ASPLOS'20, 25th International Conference on Architectural Support for Programming Languages and Operating Systems, Mar 2020

Quantum Friday, NCSU, Dec 2019

Quantum Friday, NCSU, Nov 2019

PROFESSIONAL SERVICES

Reviewer, Journal of Journal of Parallel and Distributed Computing, 2020

TEACHING EXPERIENCE

Guest Lectures on Quantum Computer Architecture, ECE792, NCSU	Fall 2020
Teaching Assistant for Microprocessor Architecture, ECE563, NCSU	Fall 2017
Teaching Assistant for Electric Circuits, ECE211, NCSU	Spring 2017
Teaching Assistant for Principles of Electrical Engineering I, ECE331, NCSU	Fall 2016

AWARDS

COE Travel Award	2020
IBM Quantum Challenge 2019 | Special Oracle Award	2019
Qiskit Advocate	2019
Yan Jici Class Scholarship, University of Science and Technology of China	2014
Excellent Freshman Scholarship, University of Science and Technology of China	2012