Jiyuan Wang

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Working Experience

Department of Computer Science — Tulane University
Assistant Professor — *Aug. 2025 – Present*

AWS Privacy Engineering — Amazon Web Service
Applied Scientist — *Mar. 2025 – Present*

AWS Privacy Engineering — Amazon Web Service
Applied Scientist Intern — *Jun. 2023 – Sep. 2023; Jun. 2024 – Sep. 2024*

Education

University of California, Los Angeles — **California, US**
Ph.D. Candidate, Department of Computer Science — *Sep. 2019 – Mar. 2025*

Tsinghua University — **Beijing, China**
B.S., Department of Physics — *Aug. 2015 – Jul. 2019*

University of Zurich — **Zurich, Switzerland**
Exchange student, Department of Physics — *Aug. 2017 – Jan. 2018*

Research Interest

Testing, Heterogeneous Computing, Big Data, Quantum Computing

Teaching Experience

Tulane University
Instructor — *Fall 2025*

- Instructor for CMPS-4660-01 (Undergraduate) and CMPS-6660-01 (Graduate), Quantum Computing.

University of California, Los Angeles
Teaching Assistant — *2024 – 2025*

- Teaching Assistant for CS 32: Introduction to Computer Science II.

Research Experience

SOLAR Group — Dept. CS, UCLA
Research Assistant — *Sep. 2019 - Present*
Advisors: **Prof. Miryung Kim and Prof. Harry Xu**

- **QDiff: Differential Testing for Quantum Software Stacks [SIGSOFT research highlight, News Report]**
  - Reported by the UCLA news website and selected for the SIGSOFT research highlight.
  - A differential testing framework for quantum programming framework.
  - To apply differential testing for quantum, we generate equivalent quantum programs, explore the backends and compiler setting options, and compare the final with K-S test.
  - For Cirq, Pyquil, and Qiskit, we found four new bugs in their simulators and two possible root causes for hardware execution divergence.
- **DuoReduce: Bug Isolation for Multi-Layer Extensible Compilation**

- A novel dual-dimensional bug isolation approach for multi-layer compilers.
- Our tool speeds up the bug isolation time by 901X, and avoids the need to inspect 7389 lines of compiler code respectively.

- **Leveraging Hardware Probes and Optimizations for Accelerating Fuzz Testing of Heterogeneous Applications**
  - A novel fuzz testing technique that enables fuzzing on real heterogeneous architectures.
  - We generate test guidance by inserting device-side in-kernel hardware probes and parallelize fuzzing with FPGAs.
  - Our tool is the first to design hardware optimizations to accelerate fuzz testing.

Software System Security Asssurance Group Dept. CS, Tsinghua University
Undergraduate Research Assistant *Jan. 2017 - Sept. 2017*
Research Advisor: **Prof. Yu Jiang**

- **QuanFuzz: Fuzz Testing of Quantum Program**
  - A fuzz testing tool for quantum programs focusing on quantum sensitive branches.
  - We regard initial states of the qubits as an input for the quantum program, and achieve mutations by applying specific quantum gates on the initial qubits.

Publications

[1] **Jiyuan Wang**, Yuxin Qiu, Ben Limpanukorn, Hong Jin Kang, Qian Zhang, Miryung Kim. DuoReduce: Bug Isolation for Multi-Layer Extensible Compilation. *FSE 2025.*
[2] Ben Limpanukorn, **Jiyuan Wang**, Hong Jin Kang, Zitong Zhou, Miryung Kim. Fuzzing MLIR Compilers with Custom Mutation Synthesis. *ICSE 2025.*
[3] **Jiyuan Wang**, Qian Zhang, Hongbo Rong, Guoqing Harry Xu, Miryung Kim. Leveraging Hardware Probes and Optimizations for Accelerating Fuzz Testing of Heterogeneous Applications. *ESEC/FSE 2023.*
[4] Qian Zhang, **Jiyuan Wang**, Guoqing Harry Xu, Miryung Kim. HeteroGen: Transpiling C to Heterogeneous HLS Code with Automated Test Generation and Program Repair. *ASPLOS 2022.*
[5] **Jiyuan Wang**, Qian Zhang, Miryung Kim, Guoqing Harry Xu. QDiff: Differential Testing of Quantum Software Stacks. *ASE 2021,* **SIGSOFT research highlight.**
[6] Qian Zhang, **Jiyuan Wang**, Miryung Kim. HeteroFuzz: Fuzz Testing to Detect Platform Dependent Divergence for Heterogeneous Applications. *ESEC/FSE 2021.*
[7] **Jiyuan Wang**, Fuchen Ma, Yu Jiang. Poster: Fuzz Testing of Quantum Program. *ICST 2021, Best Poster.*
[8] Qian Zhang, **Jiyuan Wang**, Muhammad Ali Gulzar, Rohan Padhye, Miryung Kim. BigFuzz: Efficient Fuzz Testing for Data Analytics UsingFramework Abstraction. *ASE 2020.*

Services

- PC member / reviewer of Student Forum - FMCAD 2025
- Reviewer of IEEE Software
- Sub-reviewer of FSE 2025
- FSE 2025 Artifact Evaluation Committee member
- Student Volunteer for ICSE 2022