Hao Wang

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EDUCATION

Peking University   Jun 2024
Bachelor of Science in Computer Science (Turing Class)   Beijing, China

RESEARCH EXPERIENCE

Automated Android UI Test Generation using LLM   Apr. 2023 – Jul. 2024
Advisor: Professor Tao Xie at Peking University

- Proposed using LLM to generate a test case from a test intent
- Designed tool that exploits LLM's ability to imagine to generate test cases
- Achieved best generation accuracy comparing to previous tools

Fuzzing for Configuration Testing   Jul. 2022 – Jul. 2024
Advisor: Professor Darko Marinov and Tianyin Xu at UIUC   Remote

- Designed new tools for fuzzing tests to detect misconfigurations
- Proposed new intuitions and techniques in designing fuzzing tools
- Successfully found 100+ bugs on several popular projects like Hadoop, Hive, HBase, etc.
- Achieved the highest coverage and #bugs found on large complex Java projects

Quantum Algorithms for Optimization   Mar. 2021 – May. 2024
Advisor: Professor Tongyang Li at Peking University

- Proved a lower bound on convex functions regarding quantum optimization algorithms using ball oracles
- Proposed using quantum SDEs to derived optimization algorithms similar to classical ones

Automated Android UI Testing with MAB   Mar. 2022 – Jan. 2023
Advisor: Professor Tao Xie at Peking University

- Proposed reinforcement-learning-based new ideas for automated UI testing
- Designed tools that dynamically adjust the abstraction of UI states on different apps
- Achieved better coverage results on large complex commercial apps

Random Test Prioritization   Sep. 2021 – Apr. 2022
Advisor: Professor Darko Marinov and Wing Lam at UIUC   Remote

- Proposed new algorithms to calculate the probability mass function for random orders of tests in a test suite
- Derived formulas and bounds regarding expectation of various metrics
- Proved properties of the probability mass function for various metrics
- Revealed **8 potential bugs** in boxplots used in previous papers

Regression Test Prioritization   Aug. 2021 – Aug. 2024
Advisor: Professor Darko Marinov and Wing Lam at UIUC   Remote

- Identified impractical assumptions made in prior research
- Designed new techniques for Regression Test Prioritization
- Proposed new metrics in the evaluation of Test Prioritization techniques

Combating Flaky Tests   Aug. 2021 – Mar. 2022
Advisor: Professor Darko Marinov and Wing Lam at UIUC   Remote

- Updated the IDoFT dataset of flaky tests by identifying several moved or fixed flaky tests
- Submitted **seven PRs** to multiple open-source projects
- Fixed **over ten flaky tests**

PUBLICATION

- *ConfFuzz: Parameter-Aware Configuration Fuzzing*   *Under review*
  author list omitted

- *Guardian: A Runtime Framework for LLM-based UI Exploration*   *Accepted at ISSTA 2024*
  Dezhi Ran, **Hao Wang**, Zihe Song, Mengzhou Wu, Yuan Cao, Ying Zhang, Wei Yang, and Tao Xie

- *Hierarchy-Aware Regression Test Prioritization*   *Accepted at ISSRE 2024*
  Hao Wang, Yi Pu, Jeremias Parladorio, Wing Lam, Darko Marinov, and Tao Xie

- Near-Optimal Quantum Algorithm for Minimizing the Maximal Loss   *Published as poster at ICLR 2024*
  Hao Wang, Chenyi Zhang, Tongyang Li

- Quantum Langevin Dynamics for Optimization   *Preprint Available on Arxiv*
  Zherui Chen, Yuchen Lu, **Hao Wang**, Yizhou Liu, Tongyang Li

- BADGE: Prioritizing UI Events with Hierarchical Multi-Armed Bandits for Automated UI Testing   *Published at ICSE 2023*
  Dezhi Ran, **Hao Wang**, Wenyu Wang, Tao Xie

- A Theoretical Analysis of Random Regression Test Prioritization   *Published at TACAS 2022*
  Pu Yi, **Hao Wang**, Tao Xie, Darko Marinov, Wing Lam

AWARDS

Shenzhen Stock Exchange Scholarship   Oct. 2023
                                                              Peking University

Award for Excellent Research   Oct. 2023
                                                              Peking University

Huatai Securities Scholarship   Oct. 2022
                                                              Peking University

Merit Student   Oct. 2022
                                                              Peking University

Turing Class John Hopcroft Scholarship   Oct. 2021
                                                              Peking University

Freshmen Scholarship   Oct. 2020
Third Prize   Peking University

Chinese Physics Olympiad (Province)   Sep. 2019
First Prize   Chinese Physics Society

National Olympiad of Informatics (Province)   Oct. 2018
First Prize   China Computer Federation

SKILLS

Programming Languages : Python, Java, C, C++
Proficiency in English Fluency in professional communication and writing.

Standard test scores:

- GRE: 337 (Vocabulary: 167, Reasoning: 170, Writing: 4.0)
- TOEFL: 115 (Reading: 30, Listening: 30, Speaking: 27, Writing: 28)
- IELTS: 8.0 (Reading: 9.0, Listening: 9.0, Speaking: 7.0, Writing: 7.0)