Shuai Wang

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EDUCATION

University of Illinois Urbana-Champaign Aug 2021 - Present
Ph.D. in Computer Science, Advised by Darko Marinov and Tianyin Xu

University of Illinois Urbana-Champaign June 2020 - May 2021
Visiting Scholar in Computer Science

University of California, Riverside Aug 2019 - Jun 2020
Graduate Preparation Program (GPP), Computer Science

- GPA: **4.0/4.0**

Shanghai Maritime University Sept 2016 - July 2020
Bachelor of Engineering degree, Network Engineering (Computer Science Department)

- GPA: **3.76/4.0**; Ranking: **1/72**
- (2018) Shanghai Scholarship
- (2018, 2019) The First Prize Scholarship at Shanghai Maritime University
- (2017, 2018, 2019) Shanghai Maritime University Outstanding Student Awards
- (2020) Outstanding undergraduate thesis at Shanghai Maritime University

PUBLICATION

[1] Test Selection for Unified Regression Testing
***Shuai Wang**, Xinyu Lian, Darko Marinov, Tianyin Xu*
45th IEEE/ACM International Conference on Software Engineering (ICSE'23)

RESEARCH EXPERIENCE

Coverage-guided Configuration Fuzzing Sept 2021 – Present
Advisor: Darko Marinov, Professor, Tianyin Xu, Assistant Professor, UIUC

- Guide fuzzing with both code coverage and configuration coverage
- Apply Zest and structural fuzzing to generate semantic correct configuration objects
- Generate valid configuration values with regular expressions to reduce false positive rates

Unified Regression Tests Sept 2021 – Aug 2022
Advisor: Darko Marinov, Professor, Tianyin Xu, Assistant Professor, UIUC

- Test source-code changes and configuration changes synergically during software evolution
- A configuration aware test selection algorithm to speed up test execution time

Testing Configuration-Related Performance Regressions in Large Scale Systems July 2020 – Jan 2021
Advisor: Tianyin Xu, Assistant Professor, UIUC

- Study modern systems' source code to understand how configuration impacts performance.
- Collect and analyze real-world performance issues from issue databases.
- Categorize performance-related configurations in HDFS and studied the features of systems' unit tests.
- Generate tests to expose configuration-related performance issues.

Improving Energy Efficiency of Machine Learning Frameworks on GPU Servers Feb 2020 – Jun 2020
Advisor: Daniel Wong, Assistant Professor, University of California at Riverside

- Solved incompatible issues and built TensorFlow and TensorFlow with ROCm on AMD GPU.
- Helped write and develop energy monitoring API.
- Served different machine learning models and calculated response times and power costs.
- Developed new strategy for sending requests with suitable response rates and low energy consumption.

COURSE PROJECTS

Memory Efficiency and Security Optimization for xv6 Operating System Jan 2020 – May 2020

Advisor: Heng Yin, Professor, University of California at Riverside

- Modified faster and more efficient memory allocation.
- Improved security and protection of xv6 user space.
- Implemented Copy on Write and mmap for xv6.
- Modified memory layout by implementing address space layout randomization (ASLR) on xv6.

Cache Simulator in Advanced Computer Architecture Feb 2020 –March 2020

- Implemented cache performance simulator using Least Recently Used (LRU) as cache replacement policy.
- Found the average cache miss rate to be 1.5x lower than the direct cache miss rate.
- Created a data prefetching algorithm to reduce cache miss rate.

Branch Predictor in Advanced Computer Architecture Jan 2020 - Feb 2020

- Implemented a branch prediction simulator based on 1-bit predictor and 2-bit predictor.
- Modified the simulator to (m,n) predictor whose average misprediction rate is 2x lower

SKILLS

- Technical: Java, Python, C, C++, C#
- Language: Mandarin Chinese (native), English (fluent)
- Instruments: Guitar, Piano, Violin, Bamboo flute