Pu Yi

Peking University, China

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Education

Peking University **Sep. 2018 – June 2022 (expected)**

Bachelor of Science in Computer Science (Turing Class) *Beijing, China*

- GPA: 3.71/4 (87.6/100), ranking top 20% in the department
- 2021 Award for Excellent Research
- 2021 Huirong Li Scholarship
- 2020 John Hopcroft Scholarship

Research Experience

Combating Flaky Tests. Advisors: Profs. Darko Marinov (UIUC) and Tao Xie (PKU) **July 2020 – Present**

- Analyzed theoretically and improved flaky-test detection (resulted in publication 6)
- Extended Java PathFinder to detect polluter tests (resulted in publication 5)
- Counted test orders for order-dependent flaky tests using Alloy (resulted in publication 4)
- Proposed, detected, and fixed non-idempotent-outcome tests that contain latent flakiness (resulted in publication 1)

Regression Test Prioritization. Advisors: Profs. Darko Marinov (UIUC) and Tao Xie (PKU) **April 2021 – Present**

- Analyzed theoretically random regression test prioritization (resulted in publication 3)

Bit-Flip Fault Injection. Advisors: Profs. Cyrille Artho (KTH) and Pavel Parízek (Cuni.cz) **July 2021 – Present**

- Extended Java PathFinder to systematically inject and explore bit-flip faults using Java PathFinder
- Work done in Google Summer of Code (GSoC) 2021, in preparation for submission (Project Website)

Data Stream Processing. Advisor: Prof. Tong Yang (PKU) **Oct 2019 – July 2020**

- Designed efficient data structures that memorize recent events with higher accuracy (resulted in publication 2)

Papers

1. Anjiang Wei, **Pu Yi**, Zhengxi Li, Tao Xie, Darko Marinov, and Wing Lam
   Preempting Flaky Tests via Non-Idempotent-Outcome Tests
   44th International Conference on Software Engineering
   (ICSE 2022), pages to-appear, Pittsburgh, PA, USA, May 2022

2. Yikai Zhao, Yubo Zhang, **Pu Yi**, Tong Yang, Bin Cui, and Uhlig Steve
   The Stair Sketch: Bringing more Clarity to Memorize Recent Events
   38th IEEE International Conference on Data Engineering
   (ICDE 2022), pages to-appear, Virtual Conference, May 2022

3. **Pu Yi**, Hao Wang, Tao Xie, Darko Marinov, and Wing Lam
   A Theoretical Analysis of Random Regression Test Prioritization
   28th International Conference on Tools and Algorithms for the Construction and Analysis of Systems
   (TACAS 2022), pages 217-235, Munich, Germany, April 2022

4. Wenxi Wang, **Pu Yi**, Sarfraz Khurshid, and Darko Marinov
   Initial Results on Counting Test Orders for Order-Dependent Flaky Tests using Alloy
   33rd IFIP International Conference on Testing Software and Systems
   (ICTSS 2021), pages to-appear (short paper), Virtual Conference, November 2021

5. **Pu Yi**, Anjiang Wei, Wing Lam, Tao Xie, and Darko Marinov
   Finding Polluter Tests Using Java PathFinder
   ACM SIGSOFT Software Engineering Notes 46, 2021
   (SEN 2021), 46(3), pages 37-41, July 2021
   (Extended paper of abstract presented at Java PathFinder Online Day (JPF 2020), Virtual Workshop, November 2020)

6. Anjiang Wei, **Pu Yi**, Tao Xie, Darko Marinov, and Wing Lam
   Probabilistic and Systematic Coverage of Consecutive Test-Method Pairs for Detecting Order-Dependent Flaky Tests
   27th International Conference on Tools and Algorithms for the Construction and Analysis of Systems
   (TACAS 2021), pages 270-287, Virtual Conference, March 2021

Presentations

- *A Theoretical Analysis of Random Regression Test Prioritization*, 28th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2022)
- *Systematic Bit-Flip Fault Injection and Exploration using Java PathFinder*, Java PathFinder Online Day (JPF 2021)
- *Finding Polluter Tests Using Java PathFinder*, Java PathFinder Online Day (JPF 2020)

Service

- Student Volunteer, ASE 2021, ASE 2020
- Co-reviewer, ICSE SEIP 2022, ASE 2021, ISSTA 2021

Skills

- **Extensive programming experience**
  C, C++, Java, Python, Bash, JavaScript
  Contributor of the Java PathFinder project - wrote two extensions PolDet and Bit-Flip injection engine that were merged to the master branch (the Bit-Flip injection engine was an accepted Google Summer of Code (GSoC) project)
  2019 Second Prize in Programming Contest at Peking University
  2017 Second Prize in National Olympiad in Informatics, China
- **Proficiency in English**
  Ability to write papers and communicate with English-speaking collaborators fluently
  TOEFL score: 108 (29 reading, 29 listening, 23 speaking, 27 writing); GRE score: 336 (162V, 170Q, 4A)