Yuntianyi Chen

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EDUCATION

Bachelor of Computer Science and Technology 2016.09—2020.06
Wuhan University, China

Ph.D. Student of Software Engineering 2021.09—2027.06
University of California, Irvine, USA (Expected)

WORK EXPERIENCE

- **Teaching Assistant** in University of California, Irvine 2021.09—Present
  SWE 249P - Applied Data Analytics
  SWE 247P - Applied Information Retrieval
  SWE 266P - Software Security and Dependability
  ICS 32 - Programming with Software Libraries
  INF 122 - Software Design: Structure and Implementation
  CS 113 / INF 125 - Computer Game Development
- **Research Assistant** in Wuhan University 2020.10—2021.07
  Working at the Centre of Software Testing, Analysis and Reliability (CSTAR)
- **Teaching Assistant** in Wuhan University 2017.09—2017.12
  Advanced Software Engineering

PUBLICATIONS

[1] Yuqi Huai, Sumaya Almanee, Yuntianyi Chen, Xiafa Wu, Qi Alfred Chen, Joshua Garcia. “scenoRITA: Generating Diverse, Fully Mutable, Test Scenarios for Autonomous Vehicle Planning” in IEEE Transactions on Software Engineering (**TSE 2023**), pp. 1–21, 2023

[2] Yuqi Huai, Yuntianyi Chen, Sumaya Almanee, Tuan Ngo, Xiang Liao, Ziwen Wan, Qi Alfred Chen, Joshua Garcia. “Doppelgänger Test Generation for Revealing Bugs in Autonomous Driving Software” in 45th IEEE/ACM International Conference on Software Engineering (**ICSE 2023**), May 14-20, 2023

[3] Yongfeng Gu, Yuntianyi Chen, Xiangyang Jia, Jifeng Xuan. “Multi-Objective Configuration Sampling for Performance Ranking in Configurable Systems” in 26th Asia-Pacific Software Engineering Conference (APSEC 2019), Putrajaya, Malaysia. December 2-5, 2019

[4] Yuntianyi Chen, Yongfeng Gu, Lulu He, and Jifeng Xuan. “Regression Models for Performance Ranking of Configurable Systems: A Comparative Study” in the Annual Conference on Software Analysis, Testing and Evolution (SATE 2019), Hangzhou, China. November 22-24, 2019

SERVICE

- **Sub-reviewer** of the 20th IEEE International Conference on Software Architecture (ICSA 2023), Technical Track 2022.12
- **Sub-reviewer** of the 27th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2020), Research Track 2019.11

TALKS

- Lecture on the paper "Regression Models for Performance Ranking of Configurable Systems: A Comparative Study" at the conference SATE 2019, Hangzhou, China 2019.11.22

RESEARCH EXPERIENCE

scenoRITA: Generating Diverse, Fully Mutable, Test Scenarios for Autonomous Vehicle Planning

- Introduced scenoRITA, a search-based testing framework, with a novel gene representation and domain-specific constraints, that automatically generates valid and effective driving scenarios.
- Employed an unsupervised clustering technique to group driving scenarios with similar violations according to extracted features, to automate the process of identifying and eliminating duplicate violations.
- Implemented 5 test oracles and corresponding fitness functions for the autonomous vehicle (AV), introducing the first search-based testing technique for AV software that uses multiple test oracles simultaneously and considers both comfort and safety violations as part of those oracles.

Doppelgänger Test Generation for Revealing Bugs in Autonomous Driving Software

- Presented DoppelTest, a framework that generates bug-revealing scenarios by making every obstacle an autonomous vehicle (AV) and models traffic control (e.g., traffic signals and stop signs), which automatically addresses the key challenge of determining responsibility after an AV is involved in a violation (e.g., collision).

Regression Models for Performance Ranking of Configurable Systems: A Comparative Study

- Conducted a comparative study on the common regression models used in performance ranking of software configuration research. The research is the first one that compares the regression models in terms of their ability to find good configurations and the measurement cost of sampling.

Multi-Objective Configuration Sampling in Configurable Systems

- Proposed a sampling method, which uses multi-objective optimization to minimize the number of samples we need to measure and maximize the ability to rank good configurations to the front according to the Pareto optimization. The research aims to balance the trade-off between the measurement cost and the ranking ability in the performance ranking problem.

HONORS & SCHOLARSHIPS

- Scholarship for Outstanding Students (Top 10%) in 2017-2018, 2016-2017, and 2018-2019
- Chinese Undergraduate Computer Design Contest (Regional Level, Second Prize) in 2018

SKILLS & INTERESTS

- **Research Interests**: automated testing, autonomous driving systems, software configuration, transfer learning, artificial intelligence
- **Programming Language Skills**: Python, Java, C++/C