Xuanyu Peng

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Bio

I'm Xuanyu Peng, a third-year Ph.D. student in computer science at the University of California, San Diego, advised by Prof. Loris D'Antoni. My research aims to enhance software reliability and development efficiency through program synthesis, with a current focus on its applications in specification mining, static analysis, and fuzzing. I am also interested in machine learning for code generation. I obtained my B.S. in Computer Science from Turing Class, Peking University, where I worked with Prof. Yingfei Xiong and Prof. Di Wang.

Research Experience

University of California, San Diego (Transferred from UW–Madison)   Sep 2024 – Present
Research Assistant, mentored by Loris D'Antoni
● Synthesizing Static Analyzers: Developed `NiceToMeetYou`, a program synthesis framework for abstract transformers in abstract domains heavily used by production compilers, achieving higher precision than LLVM-provided transformers.
● Specification Inference: Built `Loud`, a specification inference framework that extracts sound and precise demonic/angelic properties from nondeterministic programs.

Amazon Web Services   Jun 2025 – Sep 2025
Applied Scientist Intern, mentored by Victor Nicolet and Joey Dodds
● Data Transformation Synthesis: Proposed a schema-guided approach for synthesizing JSON transformations, applied to automatic generation of cloud scripts and cloud configuration updates.

Peking University   Sep 2021 – Jun 2023
Research Assistant, mentored by Yingfei Xiong and Di Wang
● Synthesizing Memoization: Proposed an approach to synthesize correct and efficient memoization algorithms from naive implementations.

Education

University of California, San Diego (Transferred from UW-Madison)   **La Jolla, CA, USA**
Ph.D. in Science in Computer Science   Sep 2024 - Present

University of Wisconsin, Madison   **Madison, WI, USA**
Ph.D. in Science in Computer Science   Sep 2023 - Aug 2024

Peking University   **Beijing, China**
Bachelor of Science in Computer Science & Technology   Sep 2019 - June 2023
GPA: **3.80**/4.0 (rank: **14**th/200)

Publications

[1]   Xuanyu Peng*, Dominic Kennedy*, Yuyou Fan, Ben Greenman, John Regher, and Loris D'Antoni. "Nice to Meet You: Synthesizing Practical Abstract Transformers". In: *POPL* (2026).

[2]   Kanghee Park*, Xuanyu Peng*, and Loris D'Antoni. "LOUD: Synthesizing Strongest and Weakest Specifications". In: *OOPSLA* (2025).

[3]   Yican Sun, Xuanyu Peng, and Yingfei Xiong. "Synthesizing Efficient Memoization Algorithms". In: *OOPSLA* (2023).

Scholarships and Awards

Gold Award (7th place), The 44th ACM-ICPC Asia Regionals Xuzhou Site   2019
Silver Award, The 5th CCPC Xiamen Site   2019
Peking University Merit Student   2020
Ubiquant Scholarship   2021
John Hopcroft's Scholarship at Peking University   2022

Skills

Programming Languages   C/C++, Python, Java, Rust, Coq, Racket, LaTeX