Junquan Deng

E-mail: petervirz@gmail.com · Phone: +86 173 7565 6126

Education

University of Chinese Academy of Sciences — Beijing, China
Institute of Software, Chinese Academy of Sciences — Sep 2023 – Jun 2026 (Expected)
Master's Student in Software Engineering, supervised by *Prof. Purui Su* — GPA: 3.90 / 4.00

Wuhan University — Wuhan, China
Hongyi Honor College — Sep 2019 – Jun 2023
Bachelor of Engineering in Information Security — GPA: 3.83 / 4.00

Research Interests

Software and system security, with a focus on fuzzing, program analysis, and LLM for security.

Publications

[1] Y. Liu, **Junquan Deng (Co-first author)**, X. Jia, Y. Wang, M. Wang, L. Huang, T. Wei, P. Su. "PromeFuzz: A Knowledge-Driven Approach to Fuzzing Harness Generation with Large Language Models", *ACM SIGSAC conference on computer and communications security (CCS)*, 2025 (Accepted).

Research Experience

Automated Fuzzing Harness Generation — May 2024 – Present
Leader — Supervised by *Prof. Purui Su* and *Assoc. Prof. Xiangkun Jia*, Institute of Software, CAS

- Designed and implemented an LLM-based framework for automated fuzzing harness generation. Key designs include knowledge extraction from code and documentation via program analysis and RAG, an API correlation learner, and a crash analyzer to handle LLM mistakes.
- The framework was evaluated in 22 open source projects, outperforming all existing tools. Identified 22 new vulnerabilities and received 2 assigned CVEs.
- Deployed in production environments for HarmonyOS, in collaboration with Huawei.

Rust Binding Misuse Detection — June 2025 – Present
Participant — Supervised by *Prof. Purui Su* and *Assoc. Prof. Xiangkun Jia*, Institute of Software, CAS

- Contributing to the design and development of an LLM-based framework for detecting API misuse vulnerabilities in Rust FFI (foreign function interface) binding code.

Research on Heap Vulnerability Exploitation for Cross-Version Heap Allocators — 2023
Independent Research (Bachelor's Thesis) — Supervised by *Prof. Purui Su*, Institute of Software, CAS

- Conducted a comprehensive survey of 25 heap vulnerability exploitation techniques and 42 heap allocator mitigation checks. Proposed a hierarchical model to abstract and evaluate the heap exploitation workflow.
- Developed a heap exploitation test suite to assess exploitability across different allocator versions.

Awards

National Encouragement Scholarship (twice), Alumni Scholarship, WHU Hongyi College Honors Program

Skills

- Languages: Chinese (Native), English (TOEFL 100)
- Technical Skills: C/C++, Python, Rust, ASM, Disassemblers, LLVM framework, Vulnerability analysis