Houlong Xie

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Test Development / Quality Assurance

Education

East China Normal University (Project 985), School of Software Engineering, *M.S. Candidate*
Expected Jun 2026

China University of Mining and Technology (Project 211), School of Computer Science and Technology, *B.Eng.* Sep 2018 - Jun 2022

Projects

LLM-Enhanced Network Protocol Fuzzing, Research Project Aug 2025 - Feb 2026

- **Situation**: Traditional mutation-based protocol fuzzing is constrained by low-quality initial seeds and syntax-breaking random mutations, which limits state-space exploration and vulnerability discovery.
- **Task**: Led the project to define technical direction and build a fuzzing framework that improves seed quality and mutation efficiency with LLM capabilities.
- **Action**: Built a protocol knowledge base pipeline (cleaning, semantic atomization, document-tree chunking, and vector retrieval), then proposed semantic-aware chunking to reduce hallucination and version bias. Designed a knowledge-grounded seed-enrichment agent with a "retrieve-generate-validate" ReAct loop to generate and verify high-quality interaction sequences. Aggregated field constraints into fine-grained grammar templates, applied few-shot prompting and self-consistency checks to reduce template drift, and mapped constraints to preserving and breaking mutation strategies with adaptive scheduling. Implemented and open-sourced XPGFuzz.
- **Result**: On ProFuzzBench, compared with AFLNet, XPGFuzz improved state coverage, state-transition coverage, branch coverage, and line coverage by 25.43%, 54.37%, 13.38%, and 12.26% on average; compared with ChatAFL, improvements were 15.49%, 32.39%, 14.25%, and 12.36%. It also uncovered unique vulnerabilities not found by baseline tools.

Internship

Intel Shanghai, Firmware Automation Test Development, Client Memory Initialization Team Dec 2023 - Jun 2024

- **Situation**: The team supports firmware automation for PC memory initialization. The original serial-monitoring and log-distribution solution required manual restart after each reboot and could not support real-time BIOS serial-log collection across multiple machines and readers.
- **Task**: Built a Python replacement service from scratch (serial-listener) with multi-client concurrent read and single-client write, running as a persistent background service independent from test restarts; integrated it into the team test repository for multi-machine deployment and CI/CD.
- **Action**: Designed a C/S architecture with multi-threaded HTTP handling; maintained an independent read pointer per client and returned incremental logs by offset range; persisted serial data as raw byte streams to avoid encoding issues. Encapsulated Server/Client classes and added port-occupancy detection and daemon-mode safeguards to prevent duplicate instances. Implemented automatic serial-port detection and offset-based pull APIs for test scripts and CI integration.
- **Action**: Resolved multi-machine deployment issues around port conflicts, timing, and proxy policies (including intranet proxy setup). Packaged executables with PyInstaller and standardized virtual environments and minimal dependencies for machines without Python. Assisted with GitHub Actions and self-hosted runner setup and debugging, especially proxy and PowerShell environment troubleshooting.
- **Result**: The solution passed team validation and was merged into the main repository, then deployed at scale across multiple test machines (including overseas environments). It enabled stable, restart-free, real-time multi-client log consumption and supported firmware automation pipelines in production.

SKILLS

- **Programming**: Proficient in Python; familiar with C, C++, and Java.
- **Prompt Engineering**: Heavy AI user with monthly token spending over 100 USD.
- **AI Platforms**: Hands-on with Dify, Coze, and Linkai for agent development.
- **AI Coding Tools**: Comfortable with Cursor and Claude Code for rapid prototyping and implementation.
- **Open Source**: Strong open-source interest; proficient with Git. GitHub: *https://github.com/08183080*.
- **Personal Website**: Built and maintains a personal website with Cursor: *https://www.aixpg.one/*.
- **Other**: Familiar with Linux, Docker, LaTeX, GitHub, Vercel, web crawling, LangChain, and ChatAFL.