Dongchen Xie

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Education

Wuhan University, School of Cyber Science and Engineering
Master in Electronic and Information Engineering   *Sept. 2024 – Jun. 2026*
Average Score: 86.22
Supervisor: DR. Xiaoyuan Xie, Professor, School of Computer Science, Wuhan University
Research Interests: Software Security and Large Language Models, especially using AI to tackle software issues

Shandong University, School of Cyber Science and Technology
Bachelor of Cyberspace Security   *Sept. 2020 – Jun. 2024*
Average Score: 80.36

Research Experience

LLM-Enhanced Identification of Multiple Vulnerability Patches   *Dec. 2024 – May 2025*

Existing techniques, which assume a one-to-one vulnerability-patch relationship, are ineffective due to the multiple patches. To address this, we first identify highly correlated commits using heuristic features, then employ LLMs to predict inter-patch links and form candidate groups of collectively relevant patches. Finally, we apply max-pooling on group features to determine group rankings.

LLM for Prediction of Multiple Vulnerability Patches' Relationship   *Mar. 2025 – now*

To determine the intricate relationships between patches, we first conducted a manual analysis of real-world multiple patches. Based on this empirical study, we then fed all patches of a given vulnerability to large language models with a tailored prompt for relationship analysis. Additionally, we manually annotated patch relationships as ground truth, thereby constructing the first benchmark comprising 300 samples.

Bug-Inducing Commit Identification   *Jun. 2025 – now*

Recognizing bugs aren't limited to modified lines, we use large language models' semantic capabilities to enhance accuracy. First, we apply error path slicing to capture buggy control flows. Then, select the buggy statements using LLMs. In backtracking, commits are analyzed for equivalent buggy statement substitutions and bug-preventing logic, dynamically updating statement sets and expanding traceability to accurately locate true BICs.

Publications

[ASE'25] Not Every Patch is an Island: LLM-Enhanced Identification of Multiple Vulnerability Patches
*Yi Song, **Dongchen Xie**, Lin Xu, He Zhang, Chunying Zhou, Xiaoyuan Xie**   *Co-first Author*

Honors and Awards

The 7th Open Source Innovation Competition   *National First Prize*
The Domestic Open-Source Community Vulnerability Mining Competition   *Third Prize*

Projects[1]

MFLocator
A Multi-Feature Vulnerability Patch Locator   *Nov. 2024*

SHIP
A Silent Vulnerability Patch Identification Approach Suited for Multi-patch Scenarios   *May 2025*

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[1] All these projects can be found in my homepage: github.com/xxxxdc