Xiao Cheng

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Supervisor: A/Prof. Yulei Sui

Education

- **University Of Technology Sydney** — Sydney, Australia
  Ph.D. - Software Engineering; — *2021 - Present*
- **Beijing University of Posts and Telecommunications** — Beijing, China
  Bachelor & Research Master - Software Engineering; — *2014 - 2021*

Publications

- **(ISSTA'22, CORE-A)**: **Xiao Cheng**, Guanqin Zhang, Haoyu Wang, and Yulei Sui. 2022. Path-Sensitive Code Embedding via Contrastive Learning for Software Vulnerability Detection. ACM SIGSOFT International Symposium on Software Testing and Analysis
- **(TOSEM'21, CORE-A*)**: **Xiao Cheng**, Haoyu Wang, Jiayi Hua, Guoai Xu, and Yulei Sui. 2021. DeepWukong: Statically Detecting Software Vulnerabilities Using Deep Graph Neural Network. ACM Trans. Softw. Eng. Methodol. DOI:https://doi.org/10.1145/3436877
- **(OOPSLA'20, CORE-A*, ACM SIGSOFT Distinguished Paper Award)**: Yulei Sui, **Xiao Cheng**, Guanqin Zhang, and Haoyu Wang. 2020. Flow2Vec: value-flow-based precise code embedding. Proc. ACM Program. Lang. 4, OOPSLA. DOI:https://doi.org/10.1145/3428301
- **(ICECCS'19, CORE-A)**: **Xiao Cheng**, Haoyu Wang, Jiayi Hua, Miao Zhang, Guoai Xu, Li Yi, Yulei Sui, "Static Detection of Control-Flow-Related Vulnerabilities Using Graph Embedding," 2019 24th International Conference on Engineering of Complex Computer Systems (ICECCS), DOI: https://doi.org/10.1109/ICECCS.2019.00012.

Experience

- **Teaching Assistant** — Remote
  Tutor — *Jan 2022 - Present*
  - **Teaching software analysis**: Software Analysis a.k.a Program analysis is the process of automatically analyzing the behavior of computer programs such as correctness, robustness, safety and security.
- **Learning-based Vulnerability Detection**
  Lead-Developer — *Sep 2019 - Sep 2020*
  - **Led a 6-person team to develop a new deep-learning-based embedding approach**: The approach is to static detection of software vulnerabilities for C/C++ programs by leveraging advanced recent neural networks to embed code fragments in a compact representation that preserves high-level programming logic. Wrote the paper: DeepWukong: Statically Detecting Software Vulnerabilities using Deep Graph Neural Networks.
- **Code Embedding System**
  Co-Developer — *Dec 2019 – May 2020*
  - **Collaborated with a team of 4 peers to present a new code embedding approach**: The approach presents a new code embedding approach that precisely preserves interprocedural program dependence, which successfully boosts the performance of two recent code embedding approaches code2vec and code2seq for two client applications, i.e., code classification and code summarization. Wrote the paper: Flow2Vec: Value-Flow-Based Precise Code Embedding
- **Control-Flow Related (CFR) vulnerability Detection**
  Lead-Developer — *Sep 2018 – Oct 2019*
  - **Led a team of 6 peers to develop a vulnerability detecting system**: The system tackles high-level control-flow related (CFR) vulnerabilities, such as insufficient control flow management (CWE-691), business logic errors (CWE-840), and program behavioral problems (CWE-438). Wrote the paper: Static Detection of Control-Flow-Related Vulnerabilities Using Graph Embedding.
- **Windows software analyzing and detecting System**
  Co-Developer — *Aug 2017 – Oct 2017*
  - **Collaborated with a team of 6 peers to design and build a software analyzing and bug detecting system**: The system has a high level of stability and efficiency. In charge of designing the analyzing and detecting engine part.
- **Mobile Application: PnPark**
  Lead-Developer — *July 2017 – Jan 2017*
  - **Led a 5-person team to develop a parking car sharing mobile application**: The app can be downloaded from several major app markets, including markets on both Android and IOS platform.

Honors and Awards

- 2021 International Research Training Program Scholarship (IRTP) Offer
- NASAC prototype competition third prize (2020)
- ACM SIGSOFT Distinguished Paper Award (2019)
- 2016 Interdisciplinary Contest in Modeling, Honorable Mention

Skills Summary

- **Languages**: Python, C++, Bash, JAVA, Objective-C
- **Frameworks**: Scikit, Pytorch, PyTorch Geometric, NLTK, Keras, Django
- **Tools**: Docker, GIT, PostgreSQL, MySQL, SQLite
- **Platforms**: Linux, Web, Windows, Alibaba Cloud
- **Soft Skills**: Leadership, Event Management, Writing, Public Speaking, Time Management