LING JIANG

 Github@Tricker-z   ✉ tricker51449@gmail.com
📍 Shanghai, China   ⎘ leviljiang.netlify.app

EDUCATION

Southern University of Science and Technology   *Shenzhen, China*
M.Eng. in Computer Science and Technology, GPA: 3.79 / 4.0 (ranking ~5%)   *Sep.2021 - Jun.2024 (exp.)*
Courses: *Advanced Algorithms, Advanced Artificial Intelligence, Advanced Optimization Algorithms, Intelligent Data Analytics*

Southern University of Science and Technology   *Shenzhen, China*
B.Eng. in Computer Science and Technology, GPA: 3.84 / 4.0 (ranking ~5%)   *Sep.2017 - Jun.2021*
Courses: *Operating System, Software Engineering, Software Testing, Machine Learning, Algorithms, Networking, Database*

PUBLICATIONS

[ICSE'2024] Ling Jiang, Junwen An, Huihui Huang, Qiyi Tang, Sen Nie, Shi Wu, and Yuqun Zhang. *"BinaryAI: Binary Software Composition Analysis via Intelligent Binary Source Code Matching."* [paper] [doi]

[ISSTA'2023] Ling Jiang, Hengchen Yuan, Qiyi Tang, Sen Nie, Shi Wu, and Yuqun Zhang. *"Third-party Library Dependency for Large-scale SCA in the C/C++ Ecosystem: How Far Are We?"* [paper] [code] [slides] [doi]

[ICSE'2023] Ling Jiang, Hengchen Yuan, Mingyuan Wu, Lingming Zhang, and Yuqun Zhang. *"Evaluating and Improving Hybrid Fuzzing."* [paper] [code] [slides] [doi]

[ICSE'2022] Mingyuan Wu, **Ling Jiang**, Jiahong Xiang, Yanwei Huang, Heming Cui, Lingming Zhang, and Yuqun Zhang. *"One Fuzzing Strategy to Rule Them All."* [paper] [code] [doi]

[ICSE'2022] Mingyuan Wu, **Ling Jiang**, Jiahong Xiang, Yuqun Zhang, Guowei Yang, Huixin Ma, Sen Nie, Shi Wu, Heming Cui, and Lingming Zhang. *"Evaluating and Improving Neural Program-smoothing-based Fuzzing."* [paper] [code] [doi]

RESEARCH EXPERIENCE

Tencent Security Keen Lab
Supervised by Tencent Security Researchers Sen Nie and Qiyi Tang   *Jun.2022 - Aug.2023*
- 2022 Tencent Rhino-Bird Elite Training Program (winning distinguished scholarship [link])
- Designed new algorithms to construct third-party library dependency in the C/C++ ecosystem using function-level code clone detection and graph centrality analysis for the downstream binary software composition analysis [link]
- Collaborated with Keen Security Lab to release the state-of-the-art binary software composition analysis tool

SUSTech ARiSE Lab
Supervised by Prof. Yuqun Zhang   *Sep.2020 - Jun.2022*
- Worked on the effectiveness of binary fuzzing and proposed two novel fuzzing tools with increased performance, including evolutionary-based fuzzing and gradient-guided fuzzing based on neural program smoothing
- Conducted an extensive study of hybrid fuzzing and proposed a novel hybrid fuzzer, which outperforms existing techniques and detects vulnerabilities with new CVEs (cooperated with *Prof. Lingming Zhang*, UIUC)

WORK EXPERIENCE

Tencent Security Keen Lab   *Shanghai, China*
Security Engineer Intern   *Jun.2022 - Aug.2023*
- Worked on BinaryAI, a binary file security analysis platform developed by Keen Security Lab, which is based on AI security for the applications such as software composition analysis (SCA) and malware analysis
- Contributed to BAI, a binary-to-source function similarity model based on NLP, which powers BinaryAI
- Designed and deployed new algorithms for BAI's downstream tasks, including SCA and reverse engineering

Tencent PCG   *Shenzhen, China*
Software Development Engineer Intern   *Jul.2020 - Sep.2020*
- Back-end development for Tencent QQ client, including social platform and value-added services
- Built testing frameworks and CI/CD pipelines that automate software delivery

Kwai (Kuaishou)   *Beijing, China*
Algorithm Engineer Intern   *Aug.2023 - Present*
- Contributed to the development of the private code large language model (LLM)
- Worked on intelligent tasks like code generation, context-aware conversation, defect detection, code review, etc

SELECTED PROJECTS

SPL Compiler
- Built compiler for a C-like programming language that compromises advanced features in C standard
- Implemented lexical and syntax analysis, semantics checking, IR and MIPS assembly code generation
- Supported advanced features like an n-D array, Loop, Structural equivalence, and scope checking

SUSTech Course Schema
- Web application for staff to check & download course schemas in high concurrency, deployed on distributed servers
- Responsible for back-end development, technology stack includes SpringBoot, MySQL, Redis, MQ, ES, etc
- Developed based on commonly used JAVA design patterns and refined the website security

Genetic Algorithm for TSP
- Adopted VNS-GA and IPGA to solve the multiple traveling salesman problem with the initial population based on polar coordinate classification and elitist selection
- Adopted non-dominated sorting genetic algorithm (NSGA-II) to solve the multi-objective traveling salesman problem and improved efficiency for the crowding distance sorting

OPEN-SOURCE CONTRIBUTIONS

Open-source Projects
- *FuzzBench:* Integrated our fuzzers into the Google fuzzing benchmarks to perform large-scale evaluation
- *SymCC*, *QSYM:* Improved SMT module of concolic executor to solve specific branches with increased efficiency
- *Selenide*, *Jsoup:* Detected and fixed vulnerabilities for these JAVA projects

Selected Vulnerability Discoveries
- **CVE-2022-38533:** Heap-buffer-overflow vulnerability from the program strip via crafted files in GNU binutils
- **CVE-2022-37165:** Use of uninitialized value triggered while executing jhead with the crafted JPEG files
- **CVE-2022-37166:** Invalid memory reference where address points to the zero page in Bento4

SKILLS

General:	Python, Java, C/C++, Golang, Rust, Shell, SQL, Git, LaTeX, etc
DevOps:	SpringBoot, Django, gRPC, Docker, Kubernetes, Spark, Redis, RabbitMQ, ElasticSearch, etc
SE & Security:	LLVM, Z3, LibFuzzer, Sanitizers, Intel Pin, KLEE, IDA Pro, Ghidra, etc
MLOps:	Pytorch (& Lightning), WandB, Milvus, LangChain, Jina, DVC, etc

HONORS & AWARDS

- Tencent Rhino-Bird Elite Talent Training Program Distinguished Scholarship (6 out of 70+) - 2022
- Outstanding Graduate Student Award & Undergraduate Thesis ($\sim$10%), CSE@SUSTech - 2021
- First-Class & Second-Class Merit Student Scholarship, SUSTech - 2018 $\sim$ 2020

MENTORING

- **Hengchen Yuan** (Summer 2022)   SUSTech $\longmapsto$ UT Austin PhD
- **Junwen An** (Summer 2023)   SUSTech
- **HuiHui Huang** (Summer 2023)   SUSTech