

LU HONGYI

+86 156 2529 0103 ◇ [luhy2017@mail.sustech.edu.cn](mailto:luhy2017@mail.sustech.edu.cn) ◇ <https://hongyi.lu>

Education

HKUST	2022 – Present
Ph.D. Computer Science	
SUSTech	2017 – 2021
B.Sc. Mathematics	

Working Experience

COMPASS Lab. Research Assistant	Nov. 2021 – 2022
↔ Prof. Zhang Fengwei	Southern University of Science and Technology
• Conducted research in computer systems.	

Publications

[1] Lijian Huang\*, **Hongyi Lu\***, Shuai Wang, and Fengwei Zhang. Towards Secure BPF Kernel Extension with Hardware-enhanced Memory Isolation. In *Major Revision with TDSC*, 2026.

[2] **Hongyi Lu**, Fengwei Zhang, Zhenkai Zhang, Shuai Wang, and Yanan Guo. CuSAFE: Capturing Memory Corruption on NVIDIA GPUs. In *Submission with USENIX Security*, 2026.

[3] **Hongyi Lu\***, Yunjie Deng\*, Sukarno Mertoguno, Shuai Wang, and Fengwei Zhang. MOLE: Breaking GPU TEE with GPU-Embedded MCU. In *the Proceedings of the 2025 ACM SIGSAC Conference on Computer and Communications Security (CCS, CCF-A)*, 2025.

[4] **Hongyi Lu**, Zhibo Liu, Shuai Wang, and Fengwei Zhang. DTD: Comprehensive and Scalable Testing for Debuggers. In *the Proceedings of the ACM on Software Engineering (FSE, CCF-A)*, 2024.

[5] **Hongyi Lu**, Shuai Wang, Yechang Wu, Wanning He, and Fengwei Zhang. MoAT: Towards Safe BPF Kernel Extension. In *33rd USENIX Security Symposium (USENIX Security, CCF-A)*, 2024.

[6] Wanning He\*, **Hongyi Lu\***, Fengwei Zhang, and Shuai Wang. RingGuard: Guard io\_uring with eBPF. In *the Proceedings of the 1st Workshop on eBPF and Kernel Extensions (eBPF)*, pages 56–62, 2023.

[7] Haonan Li, Weijie Huang, Mingde Ren, **Hongyi Lu**, Zhenyu Ning, Heming Cui, and Fengwei Zhang. A Novel Memory Management for RISC-V Enclaves. In *the Proceedings of the 10th International Workshop on Hardware and Architectural Support for Security and Privacy (HASP)*, 2022.

[8] **Hongyi Lu** and Fengwei Zhang. Raven: a Novel Kernel Debugging Tool on RISC-V. In *the Proceedings of the 59th ACM/IEEE Design Automation Conference (DAC, CCF-A)*, pages 1039–1044, 2022.

[9] **Hongyi Lu**, Yechang Wu, Shuqing Li, You Lin, Chaozu Zhang, and Fengwei Zhang. BADUSB-C: Revisiting BadUSB with Type-C. In *2021 IEEE Security and Privacy Workshops (WOOT)*, pages 327–338, 2021.

In total, I have published **four CCF-A papers** as first/co-first author (marked with \*), **two in Security Big4 conferences**.

Academic Service

Official Reviewer	TIFS, TDSC
Ext. Reviewer	USENIX Security 2023, S&P 2023, PoPET 2023, CCS 2023, CCS 2022

Projects

**Note:** Descriptions in *Contribution* are confirmed by my collaborators.

<b>CuSAFE</b> <a href="https://sites.google.com/view/safe-gpu">sites.google.com/view/safe-gpu</a>	
We built a system named CuSAFE. It detects memory safety vulnerabilities in CUDA programs.	
Our evaluation shows that CuSAFE beats existing tools such as compute-sanitizer ( <b>NVIDIA</b> ), cuCatch (PLDI '22, <b>NVIDIA</b> ), and LMI (HPCA' 25) in both performance and accuracy; CuSAFE also supports the LLMs such as LLaMA2 and LLaMA3. CuSAFE is approx. 13× faster than the compute-sanitizer, which is the official tool provided by <b>NVIDIA</b> .	
<i>Contribution:</i> I proposed this project and worked as the sole student; I completed the whole project myself.	2025
<b>MOLE (CCS' 25)</b> <a href="https://sites.google.com/view/mole-gpu">sites.google.com/view/mole-gpu</a>	
We proposed a new attack against existing GPU TEEs; it leverages an under-documented MCU in Arm Mali GPUs to break the security of GPU TEEs. <b>Arm</b> have acknowledged our findings and enhanced their supply-chain security.	
It breaks multiple GPU TEEs, such as StrongBox (CCS' 22, <b>Ant Group</b> ), CAGE (NDSS' 25, <b>Ant Group</b> ) and My-TEE (NDSS' 23).	
<i>Contribution:</i> I proposed this project and worked as the leader with another student Yunjie Deng. I am responsible for reverse engineering and modifying core GPU MCU firmware, while Yunjie Deng analyzed the GPU programs and tested the attack prototype.	2025
<b>MoAT (USENIX Security' 24)</b> <a href="https://sites.google.com/view/safe-bpf">sites.google.com/view/safe-bpf</a>	
We build a system named MoAT. It isolates BPF programs using hardware features like Intel MPK/Arm Stage-II.	
We have worked with a company to put it into production for <b>1,170,000 Yuan</b> .	
<i>Contribution:</i> I proposed this project and worked as the leader; I completed the whole project myself. Collaborations with the company is supervised by me and developed by another student Lijian Huang.	2024
<b>Patent ZL 2022 1 0436969.8</b>	
Kernel Space Debug Method, Device and Storage Medium	2022
<b>Translation of Software Foundation</b> <a href="https://coq-zh.github.io/SF-zh">coq-zh.github.io/SF-zh</a>	
I helped translate the Software Foundation, a famous textbook about formal verification.	2022
<b>BadUSB-C (WOOT' 21)</b>	
We uncovered a novel attack vector against USB-C devices. It enhances the power of BadUSB attacks with the video capability of USB-C. We received <b>30,000 Yuan</b> bounty award from the affected vendor.	2021