Yingtong Liu

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Education

- **University of California, Irvine (UCI)** — CA, USA
  Ph.D. of Science in Computer Science; GPA: 3.76 — *Aug. 2016 – Aug. 2022*
- **Huazhong University of Science and Technology (HUST)** — Wuhan, China
  Bachelor of Computer Science and Engineering; GPA: 3.9 (2/49) — *Aug. 2011 – July. 2015*

Interests

- **System development, Operating systems, Program analysis. Program security. Blockchain security**

Experience

- **Certik** — New York
  Sr. Software Engineer, evolution team — *Sep 2022 - May 2023*
  - I helped to improve the security of smart contracts. I mainly worked on fuzzing smart contracts by developing fuzzing tools and writing PoCs for vulnerabilities.
- **Microsoft Research** — Redmond, WA
  Research Intern, New Security Ventures Team — *June 2020 - Sep 2020*
  - I worked on developing the benchmarks and fuzzing performance metrics in Onefuzz to guide the synchronization of different fuzzers to achieve better performance.
- **University of California, Irvine** — Irvine, CA
  Research Assistant, Trustworthy Systems Lab, Advisor: Ardalan Amiri Sani — *Sep 2016 - Aug 2022*
  - I worked on the intersection of operating systems, system security and program analysis for several projects.
- **Ericsson** — Shanghai, China
  Software Engineering Intern, MME Team — *June 2017 - Sep 2017*
  - I worked on maintaining and improving Ericsson's internal Mobility Management Entity(MME) product.
- **Huazhong University of Science and Technology** — Wuhan, China
  Research Assistant, Media and Communication Lab, Advisor: Chen Tian — *Aug 2014 - Aug 2015*
  - I worked on improving the performance of data center networks.

Research projects

- **Macaron** (Nov. 2020 – Oct. 2022)

  The Google kernel fuzzing platform syzbot reports plenty of bugs caused by race condition constantly. But a lot of those bugs cannot be reliably reproduced because of their complexity. This work focuses on building a framework to automatically and reliably reproduce non-deterministic bugs without existing reproducers in Syzbot.

  Skills: LLVM, Fuzzing, Symbolic execution, Linux kernel, QEMU, C++

- **Sifter: syscall filtering** (April. 2020 – Dec. 2021)

  In Sifter, we developed fine-grained, highly-selective seccomp/eBPF filters to reduce the attack surface of security-critical Linux kernel modules and make their vulnerabilities unreachable for untrusted programs.

  Skills: Seccomp, ebpf, Linux kernel

- **Mousse** (June. 2018 – Dec. 2020)

  Mousse is a system we developed for analyzing programs that interact with complex external environments using Selective Symbolic Execution (SSE). We present solutions to overcome important challenges stemming from the program's complex environment. These solutions include a novel OS-level SSE design, environment-aware concurrent execution, and distributed execution of program paths.

  Skills: Selective symbolic execution, OS services, QEMU, Bug detection, C++/C

- **Sugar** (Sep. 2016 - Sep. 2017)

  Sugar leverages modern GPU virtualization solution to provide untrusted web applications with a dedicated virtual graphics plane. Sugar enhances the system security since a virtual graphics plane from the user space to the kernel is fully isolated from the rest of the system.

  Skills: GPU virtualization, WebGL, C++

- **Multi-Tenant Multi-Objective Bandwidth Allocation in Data centers** (Sep. 2015 - Dec. 2016)

  Bandwidth allocation in data centers should support not only performance isolation among divisions but also objective-oriented scheduling among flows within the same division. This work studies the Multi-Tenant Multi-Objective (MT-MO) bandwidth allocation problem.

  Skills: TCP/IP, Data center networks, NS2 simulation, Python

Publications

- Hsin-Wei Hung, Yingtong Liu, Ardalan Amiri Sani. **Sifter: Protecting Security-Critical Kernel Modules in Android through Attack Surface Reduction.** In Proc. ACM Int. Conf. Mobile Computing and Networking (MobiCom), October 2022.
- Yingtong Liu, Hsin-Wei Hung, Ardalan Amiri Sani. **Mousse: A System for Selective Symbolic Execution of Programs with Untamed Environments.** In Proc. ACM European Conference on Computer Systems (EuroSys), April 2020.
- Zhihao Yao, Zongheng Ma, Yingtong Liu, Ardalan Amiri Sani, Aparna Chandramowlishwaran. **Sugar: Secure GPU Acceleration in Web Browsers.** In Proc. ACM Int. Conf. Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2018.
- Chen Tian, Ali Munir, Alex X. Liu, Yingtong Liu, Yanzhao Li, Jiajun Sun, Fan Zhang, and Gong Zhang. **Multi-Tenant Multi-Objective Bandwidth Allocation in Datacenters Using Stacked Congestion Control.** In Proceedings of IEEE INFOCOM, 2017.

Honors and Awards

- External reviewer. MobiSys'21
- Student Travel Grant. ASPLOS'18
- Deans Award Stewardship. UCI. 2016
- PhD fellowship. UCI. 2016
- Outstanding Undergraduate Thesis Award (11/440). Hubei Province. 2015
- National Grant. HUST. 2014
- Academic Excellence Scholarship. HUST. 2012 & 2013 & 2014
- Scholarship for Excellent Freshman. HUST. 2011

Programming Skills

- **Languages**: C++, C, Python, Java, Solidity **Others**: LINUX, Kernel, Git, Fuzzing, Symbolic execution, S2E, Ethereum