

Xiangdong Chen

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Education

PhD in Computer Science

University of Utah

Sep 2021 – Now

- Research focuses: **operating systems, security, formal verification**
- Advisor: Anton Burtsev

BA in Computer Science

Boston University

Jan 2019 – Jul 2021

Major research projects

Atmosphere: Formally Verified Microkernel



Atmosphere is fully verified, fully featured microkernel Rust. It achieves full functional correctness of the syscalls and verification of global invariants. The microkernel consists of 5K lines of implementation code which results in 2.3K lines of abstract specification code and 11K lines of proof.

Veld: Verified Linux Drivers

Current project

Veld aims at redesigning and rewriting existing Linux device drivers to enable formal verification. It uses additional locking primitives to restrict and correct concurrent executions of the Linux kernel and drivers. To express complex properties of the device drivers, Veld defines the kernel as a comprehensive state machine to prove correctness in a concurrent environment.

Hardware support for efficient software isolation



Modify LLVM to support various hardware/software based isolation mechanisms for both X86 and Arm architecture. Isolation mechanisms include SFI, Intel MPK, Arm Pac, Arm MTE, Google NaCl and Arm Morello. Analyze their suitability for the isolation of subsystems with the tightest performance budgets

Publications

[Limitations and Opportunities of Modern Hardware Isolation Mechanisms](#). **Xiangdong Chen**, Zhaofeng Li, Tirth Jain, Vikram Narayanan and Anton Burtsev. In 2024 USENIX Annual Technical Conference (USENIX ATC 24), July 2024.

[Atmosphere: Practical Verified Kernels with Rust and Verus](#). **Xiangdong Chen**, Zhaofeng Li, Jerry Zhang, Vikram Narayanan and Anton Burtsev. In the 31st ACM Symposium on Operating Systems Principles (SOSP 2025), October 2025.

[Rust for Linux: Understanding Security Impact of Rust on the Linux Kernel](#). Zhaofeng Li, Vikram Narayanan, **Xiangdong Chen**, Jerry Zhang and Anton Burtsev. In 40th Annual Computer Security Applications Conference (ACSAC'24), December 2024.

[Atmosphere: Towards Practical Verified Kernels in Rust](#). **Xiangdong Chen**, Zhaofeng Li, Lukas Mesicek, Vikram Narayanan and Anton Burtsev. In 1st Workshop on Kernel Isolation, Safety and Verification (KISV'23), October 2023.

[Veld: Verified Linux Drivers](#) **Xiangdong Chen**, Zhaofeng Li, Jerry Zhang, Anton Burtsev. In Proceedings of the 2nd Workshop on Kernel Isolation, Safety and Verification (KISV 2024), November 2024.

[Extending Rust with Support for Zero Copy Communication](#). Arthur Lafrance, David Detweiler, Zhaofeng Li, **Xiangdong Chen**, Vikram Narayanan and Anton Burtsev. In 12th Workshop on Programming Languages and Operating Systems (PLOS'23), October 2023.

Talks

[Limitations and Opportunities of Modern Hardware Isolation Mechanisms](#). USENIX ATC 2024

[Atmosphere: Towards Practical Verified Kernels in Rust](#). KISV 2023

Academic experience

Graduate Research Assistant, University of Utah

2022 - Now

Teaching Assistant, University of California, Irvine

2021 - 2022

Industry experience

Applied Scientist Intern

Seattle, US

Amazon Web Service – Automated Reasoning

May 2025 - Aug 2025

Implement Opaque type and Async/Await support for [Verus](#)

Software Engineer Intern (Gameplay)

Hangzhou, China

NetEase Game Changqing Studio

May 2020 - Aug 2020

Collaborated with server and UX teams to implement and refactor post-match routines, spectating systems, and loading screens using UE4, C++, and Lua. Updated features such as death replays, observer perspectives, match replays, and live systems. Assisted the QA team in identifying and resolving bugs.

Skills

Languages: C, C++, Rust, Python, Assembly, Lua

Verification: Verus, Z3

Compiler: LLVM, Rustc, IR/MIR passes

Game development: Unreal Engine, OpenGL