Amir Sabbag

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Profile

Focused on systems programming, compilers, computer architecture and virtualization security. Collaborated with the Benagil team at Télécom SudParis to investigate hypervisor security. My personal projects include a Rust compiler targeting x86-64, informed by studying LLVM and rustc.

Education

BSc Computer Science and Mathematics *Ecole Polytechnique* **Palaiseau, FR**
Relevant courses are Computer Architecture, Compilers, C++, Functional Programming and Linear Algebra.

Research

Investigating Intel CET in x86_64 hypervisor environments *Ecole Polytechnique | Télécom SudParis* *2026*

- Analyzed CET's indirect branch tracking and shadow stacks, connecting them to defenses against JOP and ROP attacks.
- Implemented host level Indirect Branch Tracking and Supervisor Shadow Stacks in a research hypervisor.
- Investigated why Linux supervisor shadow stacks are difficult with legacy interrupt delivery, focusing on nested NMIs, IRET, and shadow-stack state.
- Evaluated a hypervisor-assisted guest supervisor shadow stack design using deferred NMI injection and second-level page protection, then compared it with Intel FRED as an architectural alternative.

Projects

kohnard GitHub — *Rust, x86-64*

- Built a compiler for a custom language in Rust, with a frontend, CFG optimizer, and x86-64 backend.
- Studied rustc and LLVM source code to inform the design: used ThinVec for compact AST nodes, string interning to avoid repeated string comparisons, and an LLVM-inspired CFG basic-block structure.
- Implemented jump threading, unreachable-code elimination, and basic-block merging.
- Added regression and golden tests covering compiler output and optimization behavior.

Rookstar (Chess engine) — *C++17*

- Built a C++17 chess engine with a four-person team and established its Git Flow workflow and GitLab CI pipeline.
- Created a multi-stage CMake build that generates headers of precomputed constants for the engine.
- Wrote unit and integration tests with Google Test to check engine behavior.

Skills

- **Languages:** Rust, C, C++, Python.
- **Systems and virtualization:** Linux (including NixOS), x86-64, Bochs emulator, QEMU, Proxmox.
- **Build and testing:** Make, CMake, Cargo, GitLab CI, Docker.

Extracurricular Activities

- **TEDx Committee:** Coordinated speaker outreach, logistics, and presentations for TEDx l'X 2024.
- **HiParis Hackathon:** Worked in a team to predict quarterly sales during an overnight machine learning hackathon.

Languages

- Turkish (Native), English (C2), French (C1-TCF), Russian (B1)

Interests

- Rock climbing, weightlifting, reading fiction, occasionally posting on my blog at asabbag.com.