Ionut-Cosmin Nicula

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Education

University of Bucharest — Bucharest, Romania
Bachelor of Science in Computer Science — Oct. 2020 – July 2023

Experience

Stripe — Bucharest, Romania
Software Engineer — April 2024 - Present
- Contributed to the development of **security tooling**, helping the company move away from **broad-access** tools like SSH to **safer privileged access systems** in production environments.
- Led the design of several security infrastructure initiatives, such as introducing **new permission groups** within the permission model, thus enabling the **culling of broad, unsafe SSH access in production by 65%**.
- Technical skills: Go, Security Infrastructure, Infrastructure Design

Bitdefender — Bucharest, Romania
Software Developer — Nov. 2023 - March 2024
- Participated in the **design and implementation** of a large **functionality migration** from the old C++17 codebase into the new C11 codebase, with the purpose of **significantly simplifying** business & application logic.
- Resolved low-level bugs, such as **race conditions** and **uninitialized memory access**, within **critical cryptography modules**, ensuring the **stability and security** of the system.
- Discovered and fixed subtle C11 **standard-compliance and portability issues** in our codebase, such as casts between **incompatible function pointer types**.

Junior Software Developer — Oct. 2022 - Oct. 2023
- Implemented new features for Bitdefender BOX, helping the product meet market and client demands.
- Gained experience in debugging **embedded environments**.

Software Developer Intern — Jul. 2022 - Sept. 2022
- Developed a **novel module** in C++ for Bitdefender BOX, having the function of **capturing malicious traffic** for a variety of protocols.

Projects/Contributions

nicula.xyz `[personal website]`
- I write about both high-level and low-level **optimizations**, **benchmarks**, and **performance investigations**.
- Recently discovered, investigated and reported a **Clang 19 regression** that causes **11 times** worse performance compared to **Clang 18** for certain workloads.

scout `[git.sr.ht/~_nicula/scout]`
- Developed a **pattern-matching utility** for Linux in C++.
- Explored and learned about various **regular expression optimization techniques**, such as **lazy DFAs** and **string literal extraction**.

pai `[github.com/inicula/pai]`
- Developed a simple **interpreter** for a minimal, **Python-like language**.
- Implemented languages features such as **generic lists**, **read-only strings**, and **built-in functions**.
- Written in C++ using **Flex and Bison**.

remember `[github.com/inicula/remember]`
- As a final project for the Robotics course, I developed a **memory game** in C++ for **Arduino**.
- Integrated the physical components into a **robust state machine** for a smooth gaming experience.

rtd `[github.com/inicula/rtd]`
- Developed a small utility in C++ for converting **regular expressions** to **DFAs** and generating **graphical representations**.

SansShell bugfix `[github.com/Snowflake-Labs/sansshell/pull/436]`
- Discovered and fixed a **busy-wait bug** that would lead to **100% CPU usage** for `tail` commands in **SansShell**, an **open-source** project from Snowflake.

Skills/Knowledge

Excellent knowledge of: C++23, C11, Object-Oriented Programming
Good knowledge of: Linux, Go, Rust, Networking, Multithreading, SIMD Optimizations
Basic knowledge of: Assembly Language, Compilers