

Ionut-Cosmin Nicula

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Education

University of Bucharest

Bachelor of Science in Computer Science

Bucharest, Romania

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 C++ **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, Assembly Language