Valerio Tangari

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Curious and highly motivated first-year Physics Engineering student passionate about systems programming and low level software. Strong interests in Mathematics, Theoretical Physics and Motorsport.

Education

Politecnico di Milano   Milano
B.Sc. Physics Engineering   06/2024 - Present

Relevant Courses I'm taking:

- Fundamentals of Computer Sciences (Computer Programming)

- Algorithms and Data Structures

- Theoric Foundations of Computer Sciences

- Experimental Course: Quantum Information Processing (Quantum Computing and Algorithms)

Liceo di Orbetello   Orbetello
Liceo Scientifico   09/2019 - 06/2024

Technical Skills

Programming Languages: C, C++, C#, Go, Rust, Assembly
Tools: QEMU, Git, GitHub, Linux, Windows
Concepts: CI/CD, OS Development, Devops

Projects

x64OS   10/2024 - Present

A minimalistic open source AMD64 OS which aims to be Posix compliant.

Design and implementation of a 64-bit Unix-like operating system from scratch, focusing on low-level programming, memory management, and kernel architecture; running on QEMU. Key features include:

- Boot process: custom bootloader, GDT setup, paging, and long mode transition

- Memory: custom heap allocator (kmalloc, kfree, krealloc) with aligned blocks and splitting/merging

- Kernel architecture: cooperative multitasking with idle loop

- Interrupts: PIC and PIT setup with IDT handling

- Filesystem: modular VFS layer with disk-based file system and POSIX-like syscalls (read, write, open, stat, sleep)

- Shell: command-line interface with support for cd, mkdir, touch, ls, etc.

- Drivers: VGA and Keyboard for I/O and IDE for disk

Skills: C, x64asm, QEMU, Make, Git

Some metrics:

- Single core CPU usage at just 20%, emulator included.

- Less than 100KiB binary size.

- 2MB paged Heap.

- Debugging enabled with kprint and kprintf

Chip-8 Emulator   03/2025 - 03/2025

Created a complete Chip-8 Emulator in Rust using SDL, following this guide.

Lossy Compression Evaluation — Winner of CERN-HSF GSoC 2025 Preselection   03/2025 -03/2025

Analysis of lossy float compression (8/16-bit) on statistical metrics such as MSE and variance of main distributions (Gaussian, exponential and uniform) in C++. Metrics are then processed by a python script that plots: errors, binary size changes and evaluation comparisons. The project was selected by CERN-HSF for the 2025 Google Summer of Code proposal phase.

OPEN SOURCE AND HACKATHONS

uutils coreutils   03/2025 - Present

Rust implementation of GNU coreutils.

- Built the edge case test for the arch command to handle unrecognized architectures.

Microsoft Mimalloc   03/2025 - 03/2025

General purpose allocator.

- Helped fix a paging purge bug.

MLH Cloud Hack Week   03/2025 - 03/2025

Developed a chatbot using Python and the OpenAI API, leveraging snowflake and Microsoft Azure for data management and deployment.

CERTIFICATIONS

- GitHub Foundations
- Foundational C# with Microsoft

LANGUAGES

Italian -Native
English -Fluent
Spanish -Limited Working Proficiency
German -Elementary Proficiency