

# BRUNO BARCAROL GUIMARÃES

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## PERSONAL PROJECTS

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I am fascinated by programming languages (C/++, Lua/Python, assembler), computer architecture and operating systems, automated testing, graphics and physics simulation, and heterogeneous computing. Here are some of my personal projects, where I strive to create software which is:

- portable (x86/ARM, POSIX/Wasm/Windows)
- documented (Doxygen), tested (strict warnings, sanitizers, QTest unit tests, integration tests)
- easily built/distributed (Make, Autoconf, premake)

More at <https://gitlab.bbguimaraes.com>.

**nngn** – 2D/3D graphics/physics/audio/game engine

- C++20, Lua, Rust. Independent TUI / GUI (Qt) tools, [WebAssembly build](#).
- **Graphics**: Vulkan, OpenGL/ES, ASCII rasterizer. Dynamic lights/shadows, post-processing, HDR.
- **Compute**: OpenCL compute back end, CPU/OpenCL collision detection, particle simulation.

**gdb\_lua** – GDB commands for embedded Lua

- Statically-typed Python using the GDB Python API, support for multiple Lua versions at runtime.
- Data/call stack inspection, debugging data, pretty printers, recursive expansion of tables/structures.

**machinatrix** – chat robot for the Matrix decentralized communication protocol

- C11, POSIX networking, SQLite, `libcurl`, `tidy`, `cjson`, layered architecture, privilege separation.

[bbguimaraes.com](https://bbguimaraes.com) – personal website

- [static](#), [git](#), [gitlab](#), [matrix](#), [nextcloud](#), [mastodon](#)
- built/deployed using Linux containers

**codex** – code experiments, research notes

- `cpp.lua`: C preprocessor which outputs detailed information about macro expansion.

**impero** – graphical command executor (C++20, Qt)

**dotfiles** – scripts, **ansible** PC/server configuration

## EDUCATION

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- [Universidade de Caxias do Sul](#): [Bachelor of Computer Science](#) (2008–2013), Linux administration (2011), [research projects](#) (2010–2011)
- [UniFtec](#): computer technician (2005–2007)

## PROFESSIONAL EXPERIENCE

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[Red Hat](#) (2016–2023), OpenShift

- Worked on the [continuous integration system](#), a highly parallel, distributed scheduler/executor built with OpenShift/Kubernetes clusters.
- Supported around 1k repositories, 80 organizations, 1k developers, 40k jobs, 250 compute nodes, 20k jobs/day, 5k ephemeral test clusters/day.
- Designed and implemented the current [test DSL and executor](#), separating test scripts into discrete steps, allowing complex test scenarios, greatly simplifying them and making execution robust and intuitive.
- Transitioned a mostly legacy code base into a reliable and thoroughly tested project.
- Maintained performance of tools and services processing large amounts of data by constant analysis and optimization.
- Wrote extensive [internal/external documentation](#).
- Entirely free/open-source work.

[Universidade de Caxias do Sul](#) (2012–2015), IT Dep.

- Worked on the infrastructure and web applications serving 30k users (teachers, students, employees).
- Applications (Linux, Python, containers) and services (web servers, cache, task queues, databases), tools (CI, ticket system), integrated authentication.

## ETC.

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- Brazilian/Italian nationality, languages:
  - fluent: Portuguese, English
  - familiarity: Italian, Spanish, Latin, Greek, Czech
- <https://bbguimaraes.com/blog>: I semi-frequently write about topics that interest me — mathematics, music, C++ virtual tables, IEEE 754 floating-point arithmetic, Perl, and other amusing things.
- <https://bbguimaraes.com/talks>: I have given talks over the years at events of all sizes, from local LUGs to internal company presentations to Linux/ContainerCon/FISL.
- <https://bbguimaraes.com/music>: I enjoy playing all kinds of instruments (bass, piano, mandolin, guitar, drums, ...), recording performances, writing music scores, [playing in bands](#).
- literature, philosophy, history, art, languages, traveling, strength training, hiking, cycling, cooking, ...