

José Henrique Targino Dias Góis

Systems Software Engineer | Rust, Linux, ELF and `no_std`

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Professional Profile

Systems software engineer and PhD-trained computational researcher developing open-source Rust infrastructure for Linux userspace. Work centers on safe low-level abstractions, system-call interfaces, memory and process models, ELF64 loading, assembly bootstrap, and `no_std` execution. Combines systems engineering with experience designing reproducible computational workflows, analyzing complex datasets, and publishing peer-reviewed research.

Proposed Professional Focus

Advance memory-safe, auditable systems software in Rust for Linux and resource-constrained environments. The intended work includes reusable kernel-interface abstractions, executable-loading infrastructure, reproducible systems experiments, and educational tooling that makes low-level software behavior easier to inspect, validate, and teach.

Selected Systems Contributions

Userspace

Founder and lead developer

2023–Present
Rust 2024 | x86_64 | BSD-3-Clause

- Designed an experimental Rust standard-library layer for Linux userspace applications that can operate without the Rust standard library.
- Implemented ELF64 program loading for static, PIE, and interpreter-based executables, including segment mapping, load bias, permission handling, auxiliary-vector preparation, and reconstructed process stacks.
- Developed memory-management components for stack traversal, page allocation, guarded stack mappings, and rollback of partially created image mappings.
- Built architecture and operating-system abstraction layers intended to keep kernel-facing behavior explicit while preserving modularity and memory-safety guarantees.
- Maintains reproducible host-side regression fixtures for executable loading, large BSS regions, address collisions, auxiliary vectors, and macro layout.

Ample

Kernel-interface abstraction library

2023–Present
Rust | `no_std`

- Develops reusable Rust interfaces over Linux system calls and kernel services, including file access, memory mapping, processes, and architecture-dependent operations.
- Provides the lower-level platform layer used by the Userspace ecosystem and supports both standard-library and `no_std`-oriented development.

Technical Leadership and Engineering Practice

- Owns architecture, implementation, release automation, documentation, cross-target builds, and repository-based continuous integration for an independently developed Rust crate ecosystem.
- Works across Rust, assembly, C, ELF/GABI conventions, Linux process initialization, memory protection, and low-level debugging with Cargo, QEMU, GDB, Git, and GitHub Actions.
- Applies research practices to engineering: explicit assumptions, reproducible fixtures, testable interfaces, quantitative investigation, and documented limitations.

Research Record and Professional Qualifications

Research Experience

Graduate Researcher <i>Instituto do Cérebro, Universidade Federal do Rio Grande do Norte</i>	2012–2020 Natal, Brazil
- Designed and executed reproducible computational workflows for electrophysiology, microscopy, neuronal activity, behavioral datasets, scientific publishing metrics, and open neuroscience data. - Combined experimental work with MATLAB-based data processing, statistical analysis, scientific visualization, and interpretation of neuronal population activity. - Co-authored peer-reviewed work spanning computational neuroscience, cellular neurophysiology, human neuroscience, and bibliometrics.	
Programmer <i>AR Consultoria em Informática</i>	2005–2006 Natal, Brazil
Maintained and developed enterprise information-management modules using Delphi/Pascal and Firebird SQL.	

Selected Peer-Reviewed Publications

Góis, Z. H. T. D., et al. (2018). “Characterizing Speed Cells in the Rat Hippocampus.” *Cell Reports*, 25(7), 1872–1884.e4. doi:10.1016/j.celrep.2018.10.054. Analysis of an open behavioral-neuroscience dataset to characterize the relationship between locomotion speed and hippocampal neuronal activity.

Leão, R. N., et al. (2015). “Interconnection and Synchronization of Neuronal Populations in the Mouse Medial Septum/Diagonal Band of Broca.” *Journal of Neurophysiology*, 113. doi:10.1152/jn.00367.2014. Experimental and analytical investigation of neuronal connectivity and synchronization.

Mota-Rolim, S. A., et al. (2013). “Dream Characteristics in a Brazilian Sample: An Online Survey Focusing on Lucid Dreaming.” *Frontiers in Human Neuroscience*, 7:836. doi:10.3389/fnhum.2013.00836. Web-based data collection and quantitative analysis of a 1,000-participant sample.

Tort, A. B. L., Targino, Z. H., and Amaral, O. B. (2012). “Rising Publication Delays Inflate Journal Impact Factors.” *PLOS ONE*, 7(12):e53374. doi:10.1371/journal.pone.0053374. Quantitative analysis of 61 neuroscience journals demonstrating distortions caused by online-to-print publication delays.

Education

PhD in Neuroscience , UFRN — Computational Neuroscience	2020
MSc in Neuroscience , UFRN — Molecular Neuroscience	2015
BSc in Information Technology , UFRN	2025
BSc in Science and Technology , UFRN	2012
BSc in Computer Science , UFRN	Expected 2028
Technology Degree in Information Security , UNINTER	Expected 2029

Research Support

Recipient of research scholarships and training support from Brazilian and international institutions, including CNPq, CAPES, and CONICET, across projects in computing, neuroscience, and computational research (2009–2024).

Core Competencies

Systems	Linux, system calls, ELF64/GABI, process startup, memory mapping, assembly bootstrap, no_std, x86_64
Programming	Rust, C, C++, Python, Shell, MATLAB, Delphi/Pascal
Engineering	Cargo, QEMU, GDB, Git, GitHub Actions, cross-target compilation, CI, reproducible testing
Research	Computational workflows, quantitative analysis, electrophysiology, microscopy, behavioral data, scientific writing
Languages	Portuguese (native), English (professional working proficiency), Spanish (intermediate)