

Eliseu Venites Filho

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SKILLS

Languages: Portuguese (Native), English (Fluent), French (Advanced)

Programming: C, C++ (C++17, boost), Rust (tokio, rayon, faer), Python (Pandas, NumPy, SciPy, scikit-learn, matplotlib, PyTorch, TensorFlow), Julia (DataFrames.jl, Plots.jl, Makie.jl), Haskell (megaparsec), Delphi

Tools: Databases (SQLite, PostgreSQL, DuckDB), Docker, Nix

EXPERIENCE



Software Engineer

Nelógica

Porto Alegre, Brazil

Feb. 2026 - Present

- Engineer low-latency, high-performance backend microservices in Delphi as part of the Automation Tools team, serving thousands of daily active users
- Sustain high availability on mission-critical legacy systems through proactive maintenance and infrastructure hardening
- Reduce manual processing time by automating workflows and building custom internal tools that scale operations across teams
- Deploy and operate services across AWS, Azure, and Equinix infrastructure, using GitLab CI pipelines within an Agile/Scrum team workflow



Ph.D. in Computational Statistical Physics

Universidade Federal do Rio Grande do Sul

Porto Alegre, Brazil

Jul. 2021 - Feb. 2026

- Doctoral research funded by a CNPq scholarship
- Analysis of the ensemble correlations of observables of complex systems in order to predict their critical behavior
- Systems from different Universality Classes considered
- Both systems with and without a defined Hamiltonian considered
- The simulations were implemented in Rust while the data analysis was done in the Julia ecosystem



M.Sc. in Computational Statistical Physics

Universidade Federal do Rio Grande do Sul

Porto Alegre, Brazil

Mar. 2019 - May 2021

- Master's research funded by a CNPq scholarship
- Scored higher than 99.42% of candidates on the EUF 2-2018 (National graduate programs entrance exam)
- Performance evaluation of the Simulated Annealing applied to different configurations of the Traveling Salesman Problem
- Analysis of the stochastic optimization algorithm applied to problems at the boundary between P and NP complexity classes
- The optimization algorithm was implemented in C++ while the data analysis was done in the Python ecosystem



Optical Engineering Internship

Télécom ParisTech

Paris, France

Jun. 2017 - Sep. 2017

- Improved photon-pair coincidence count rate by engineering active stabilization of a polarization-entangled photon-pair source
- Enabled reliable Quantum Key Distribution (QKD) protocol testing by optimizing signal count rates within the Information Quantique et Applications research group



Undergraduate Research (Scientific Initiation)

Universidade Federal do Rio Grande do Sul

Porto Alegre, Brazil

Jun. 2013 - Jun. 2015

- Conducted CAPES-funded undergraduate research in Quantum Information
- Gave presentations on quantum algorithms such as Shor's and Grover's

EDUCATION



Institut d'Optique Graduate School
Diplôme d'Ingénieur

Palaiseau, France
Sep. 2015 - Sep. 2017

- Double degree in the context of BRAFITEC program
- Optical Instrumentation, Automation, Lasers and Quantum Optics



Université Paris-Saclay
L3 et M1 en Physique Fondamentale

Orsay, France
Sep. 2015 - Sep. 2017

- Double degree in Theoretical Physics offered to engineering students
- Analytical Mechanics, Statistical Physics, Plasma Physics and Atomic and Molecular Physics



Universidade Federal do Rio Grande do Sul
B.Sc. in Engineering Physics

Porto Alegre, Brazil
Mar. 2013 - Dec. 2018

- Graduated Summa Cum Laude with a final GPA of 9.54/10.0
- Solid State Physics, Electronics, Microprocessors, Photonics and Material Analysis

PROJECTS

[tsp-sa](#) | C++ / Python

- Built a modular C++ optimization library implementing Simulated Annealing for the M.Sc. research
- Supports Generalized Simulated Annealing and Tsallis Entropy statistics
- Decoupled the optimization core from the TSP implementation, enabling reuse across arbitrary Markov chain problems
- Automated data analysis and plotting in Python to accelerate research iteration

[artificial-systems](#) | Rust (ndarray, serde)

- Implemented high-performance Rust simulations of computational models for the Ph.D. research
- Modeled Spin Systems (Ising and Blume-Capel models) at scale
- Investigated the Contact Process with diffusion

[ts-cov-matrix](#) | Julia (DataFrames.jl, Makie.jl)

- Applied Random Matrix Theory to analyze time-series covariance matrices for the Ph.D. research
- Compared spectral properties against the Marchenko-Pastur distribution across NOAA temperature records, Spin Systems, and Contact Processes
- Built a full data analysis pipeline in the Julia ecosystem (DataFrames.jl, Makie.jl)

[json-parser](#) | Haskell

- Strict JSON parser implemented in Haskell using Megaparsec
- Adheres closely to JSON standards
- Can be used as a library or a standalone command-line tool

[sternhalma-server](#) | Rust (tokio)

- Asynchronous game server for Sternhalma (Chinese Checkers) built with Rust and Tokio
- Actor-like architecture with decoupled game logic and connection handling
- Client-agnostic design supporting CLI, GUI, and AI agents
- Supports both Raw TCP and WebSocket connections using a CBOR-based protocol

[sternhalma-agent \(WIP\)](#) | Python (PyTorch)

- Reinforcement learning agent implementing AlphaZero from scratch
- Uses Monte Carlo Tree Search (MCTS) for planning and Deep Neural Networks (ResNet) for evaluation
- Designed to master Sternhalma through self-play without human knowledge

PUBLICATIONS

[Revisiting the Contact Model with Diffusion Beyond the Conventional Methods](#)

2025

Symmetry

R. da Silva, E. Venites Filho, H. A. Fernandes, P. F. Gomes

[Efficient computational method using random matrices describing critical thermodynamics](#)

2025

International Journal of Modern Physics C

R. da Silva, E. Venites Filho, S. D. Prado, J. R. Drugowich de Felício

 A Spectral Investigation of Criticality and Crossover Effects in Two and Three Dimensions: Short Timescales with Small Systems in Minute Random Matrices

2024

Entropy

E. Venites Filho, R. da Silva, J. R. Drugowich de Felício

 Mean-Field Criticality Explained by Random Matrices Theory

2023

Brazilian Journal of Physics

R. da Silva, H. C. M. Fernandes, E. Venites Filho, S. D. Prado, J. R. Drugowich de Felício

 A Thorough Study of the Performance of Simulated Annealing in the Traveling Salesman Problem under Correlated and Long Tailed Spatial Scenarios

2021

Physica A: Statistical Mechanics and its Applications

R. da Silva, E. Venites Filho, A. Alves