Eliseu Venites Filho

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Skills

Languages: Portuguese (Native), English (Fluent), French (Advanced)
Programming: C, C++, Rust, Python, Julia, Haskell, Delphi
Libraries: tokio, ndarray, serde, faer-rs, Pandas, NumPy, SciPy, scikit-learn, matplotlib, PyTorch, TensorFlow, DataFrames.jl, Plots.jl, Makie.jl
Tools: Linux, Git, Docker, SQL
Typesetting: LaTeX, Typst

Experience

Software Engineer — Porto Alegre, Brazil
Nelogica — *Feb. 2026 - Present*

- As part of the Automation Tools team
- Builds low-latency, high-performance microservices using Delphi to serve thousands of daily users
- Maintains mission-critical legacy systems, ensuring high availability and robust stability for core operations
- Automates internal workflows and develops custom tooling to scale processes and improve overall efficiency

Optical Engineering Internship — Paris, France
Télécom ParisTech — *Jun. 2017 - Sep. 2017*

- As part of the Information Quantique et Applications research group
- Worked with polarization-entangled photon pairs source
- Stabilization and count optimization of the entangled photon pair source to be used in experiments testing Quantum Key Distribution protocols

Education

Universidade Federal do Rio Grande do Sul — Porto Alegre, Brazil
Ph.D. in Computational Statistical Physics — *Jul. 2021 - Feb. 2026*

- 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

Universidade Federal do Rio Grande do Sul — Porto Alegre, Brazil
M.Sc. in Computational Statistical Physics — *Mar. 2019 - May 2021*

- 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

Institut d'Optique Graduate School — Palaiseau, France
Diplôme d'Ingénieur — *Sep. 2015 - Sep. 2017*

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

Université Paris-Saclay — Orsay, France
L3 et M1 en Physique Fondamentale — *Sep. 2015 - Sep. 2017*

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

Universidade Federal do Rio Grande do Sul — Porto Alegre, Brazil
B.Sc. in Engineering Physics — *Mar. 2013 - Dec. 2018*

- Scientific Initiation (CAPES) on Quantum Information in 2013 and 2014
- Presentation at the UFRGS XXVI Scientific Initiation Meeting (2014): Shor's Algorithm for Integer Factorization
- Summa Cum Laude with final grade 9.54/10.0

Projects

tsp-sa | *C++ / Python*
- Developed in the context of the M.Sc. research
- Modular C++ library to perform optimization through Simulated Annealing
- Supports Generalized Simulated Annealing and Tsallis Entropy statistics
- Optimization logic works for arbitrary Markov chains, completely decoupled from the TSP implementation
- Data analysis and plotting done in Python

artificial-systems | *Rust (ndarray, serde)*
- Developed in the context of the Ph.D. research
- Computational models of artificial systems implemented in Rust
- Simulation of Spin Systems (Ising and Blume-Capel models)
- Investigation of the Contact Process with diffusion

ts-cov-matrix | *Julia (DataFrames.jl, Makie.jl)*
- Developed in the context of the Ph.D. research
- Analysis of time series covariance matrices using Random Matrix Theory
- Study of spectral properties and comparison with Marchenko-Pastur distribution
- Analyzed data from NOAA temperature records, Spin Systems, and Contact Processes
- Full data analysis pipeline implemented in the Julia ecosystem

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. D. 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 Felicio

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