Srdjan Sarikas, PhD

Scientific Software & Data

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Physicist turned computational scientist. For 10+ years I've built scientific software for research teams and R&D organizations, in the space between domain experts and engineers. With AI, building is cheap; knowing what to build isn't. I find out what users actually need, design how they'll work with it, and deliver trustworthy software end to end.

Professional Experience

since 06/24 **Independent Consultant in Computational Sciences, Data and AI**, Vienna

Partnered with individuals, startups, and large organizations to design and implement bespoke computational systems tailored to their needs. Projects included:

- Built European Pharmacopoeia-compliant software at Minerva Biolabs that replaced Excel: from raw data to the reported result and its uncertainty, readable by lab staff.
- Author of synfit, open-source dose-response and drug-synergy fitting package (on PyPI), and web app (synfit.app): Hill models, explicit noise models, Bliss / HSA / Loewe / ZIP synergy.
- Author of bioio-vsi, an open-source reader for Olympus/Evident cellSens VSI microscopy images without Java (on PyPI): undocumented format reverse-engineered from sample files, validated against Bio-Formats.
- Author of wfdisc, an open-source Rust library for reading seismological waveform data (CSS 3.0 / NNSA KB Core), cross-validated against ObsPy.
- Consulted for Discovery Evolution, an in-silico biologics-discovery start-up, in its early stage.
- Developed interactive applications enabling expert users to design and explore complex sensor configurations and large-scale datasets in real time.
- Designed a procedural-support platform for field operators at an international organization in a strictly regulated environment: formalized SOPs to reduce cognitive load and error rates.
- Advised startups and research groups on data strategy, computational architecture, and analytical robustness, helping them avoid unproductive directions through early feasibility validation.

10/22–04/24 **Senior Data Scientist**, *Zühlke Engineering Austria*, Vienna

Bridged scientific and engineering domains to modernize computational systems and deploy AI-assisted internal tools for knowledge management and documentation analysis.

- Built an LLM-based framework analyzing 800+ internal SOPs at a multinational client, defining clear KPIs that enabled leadership to spot gaps and standardize communication across teams.
- Refactored and optimized large scientific codebases, under strict test regimes, for up to 15× faster performance and greater maintainability.
- Designed and implemented algorithms that enabled smooth interaction with terabyte-scale data on consumer hardware, boosting the efficiency of technical operators.

09/19–09/22 **Research Scientist in Biomedical Data Analysis**, *Medical University of Vienna*

Designed and implemented computational pipelines for biomedical research, transforming experimental data into reproducible, insight-driven results adopted by multiple research groups.

- Built an end-to-end pipeline for analysis of microscopy videos (stabilization, segmentation, multi-scale event detection with a Poisson noise model, review UI, publication-ready statistics); cut analysis from days of manual work to under an hour plus a short expert review (github.com/szarma/Physio_Ca).
- Designed and deployed a first-of-its-kind database of experimental data, with interactive apps enabling scientists to explore many experiments simultaneously, revealing effects the lab had long suspected but could not show.
- March 2020: in a few-day sprint with the EpiMath team, coded and fitted the SEIR model behind the expert paper the Austrian government cited when tightening its measures (epimath.at, *ORF coverage*).

06/13–07/19 **Research Scientist in Computational Biology**, *Institute of Science and Technology Austria (ISTA)*, Vienna

Focused on data-driven modeling and analysis in computational biology, using machine learning and Bayesian inference to reveal organizational principles of genomic and membrane systems.

- Biophysical models of gene regulation (protein–DNA binding) fitted to high-throughput data with CNNs (TensorFlow) and multi-tempered MCMC; two *eLife* papers.
- Built Bayesian models and visualization concepts for single-molecule quantitative imaging, revealing spatial patterns in live-cell microscopy data.
- Authored and taught introductory programming courses (*Best Lecturer* Award); teaching assistant for the PhD core course *Data Science and Scientific Computing*.

02/11–05/13 **Research Scientist in Cosmology and Astroparticle Physics**, *Max Planck Institute for Physics*, Munich

Modeling and simulation of high-dimensional dynamics, focused on numerical stability.

- Built and maintained simulation frameworks for nonlinear dynamical systems, combining analytical modeling with high-performance, reproducible scientific software in Fortran and Python.
- Developed analytical workflows to extract key statistics and physical insights from vast simulation datasets, transforming raw numerical output into interpretable results.

Education

2009–12 **PhD in Physics**, *University of Naples Federico II*, Italy

Thesis: *Neutrino Oscillations at High Densities: Cosmological and Astrophysical Aspects*

2008 **Diploma in Physics**, *University of Novi Sad*, Serbia, 9.73/10

Skills

Programming, AI & Agents

- Python (primary), R, Bash, Git, Docker; with AI agents productive in any mainstream language, most recently Rust, TypeScript, Java; earlier Fortran, C/C++.
- Clean architecture; API design as UX (ergonomics, naming, failure modes); legacy refactoring.
- LLM applications: RAG, LangChain, multi-provider APIs (OpenAI, Anthropic, OpenRouter).
- Agent orchestration: parallel coding agents (Claude Code, Codex, Cursor), sub-agents, cross-session coordination; review and verification gates, not blind trust.
- Agent tooling: custom skills, MCP servers, hooks; rules, tests and checks for safe agent work.

Data Science, Visualization & Reporting

- NumPy, Pandas, SciPy, scikit-learn, statsmodels, TensorFlow.
- SQL (PostgreSQL, TimescaleDB, Oracle).
- Dash, Plotly, HoloViz, Bokeh, Datashader, LaTeX, pandoc, mkdocs, html.
- Statistics (parametric, non-parametric), clustering, anomaly detection; signal processing and time-series analysis, instrument response and calibration.

Modeling, Machine Learning & Scientific Computing

- Dynamic, probabilistic, and machine-learning models to extract structure from complex data; Bayesian inference, model interpretability, uncertainty quantification.
- Numerical modeling and simulation of dynamical systems (stiff ODEs, stability analysis); HPC environments (SLURM), parallel computation, parameter optimization.

Interpersonal & Communication

- Effective communicator bridging scientists, engineers, and stakeholders.
- Experienced mentor and technical lead in interdisciplinary teams.
- Fluent in English and Italian; effective in German; native Serbian.

Beyond Work

Curious about environmental science, medicine, economics, psychology, linguistics, and history. Certified (though long-expired) scuba diver; enjoy choral singing, travel, and building DIY furniture. Most of all, I enjoy time with family.