Srdjan Sarikas, PhD

Data · AI · Software for Science *sarikas.me*

Independent consultant and software developer at the intersection of science, data, and engineering. I help research teams and R&D organizations turn complex problems into reliable, scalable tools — from interactive visualization to advanced modeling. 10+ years of interdisciplinary experience bridging scientific expertise and modern software practices.

▬▬ Professional Experience

2024– **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:
- Developed interactive applications enabling expert users to design and explore complex sensor configurations and large-scale datasets in real time.
- Led the design of a procedural-support system for field operators, reducing cognitive load and error rates while formalizing SOPs for scalable, quality-assured field operations.
- Advised startups and research groups on data strategy, computational architecture, and analytical robustness, helping them avoid unproductive directions through early feasibility validation.

2022–24 **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 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 $15\times$ 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.

2019–22 **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 end-to-end pipeline for signal extraction from hours-long videos, and downstream statistical analysis; reduced experiment analysis time from one week of manual work to a few hours of largely unsupervised computation. (See on github).
- Designed and deployed first of a kind database of experimental data, with interactive apps enabling scientists explore many experiments simultaneously, yielding paradigm-shifting insights.
- Initiated and implemented an independent Austria-specific COVID-19 SEIR model with parameter fitting algorithms, under immense time-pressure by the Federal Chancellery, producing early projections for high-level briefings (epimath.at, *ORF coverage*).

2013–18 **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.
- Modelling for high-throughput studies, optimizing biophysical models through CNN architectures (TensorFlow) and multi-tempered MCMC, advancing understanding of genomic organization.
- 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, earning *Best Lecturer* Award; created educational videos and animated simulations for public outreach.

2011–13 **Research Scientist in Cosmology and Astroparticle Physics**, *Max Planck Institute for Physics*, Munich

Developed quantitative modeling and simulation foundations that later informed my data-science and systems-design work. Focused on high-dimensional dynamics, numerical stability, and computational reliability.

- Built and maintained simulation frameworks for nonlinear dynamical systems, combining analytical modeling with high-performance, reproducible scientific software in Fortran and Python.
- Analyzed model stability and parameter sensitivity to quantify uncertainty and define reliable operating ranges for complex simulations.
- 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 & Architecture
- Python (primary), R, Bash, Git, Docker.
- Familiar with Fortran, C/C++, Java, TypeScript.
- Experienced in code optimization, clean architecture, reproducible pipelines, and AI-augmented development workflows.

Data Science, Visualization & Reporting
- NumPy, Pandas, SciPy, scikit-learn, statsmodels, TensorFlow.
- SQL (PostgreSQL, TimescaleDB, Oracle).
- Dash, Plotly, HoloViz, Bokeh, Datashader, LaTeX, pandoc, mkdocs, html.
- Statistical analysis (parametric, non-parametric), signal analysis, clustering, and anomaly detection.

Analytical Modeling & Machine Learning
- Design and application of dynamic, probabilistic, and machine-learning models to extract structure from complex data.
- Focus on model interpretability, uncertainty quantification, and integration into scientific and engineering workflows.

Scientific & High-Performance Computing
- Numerical modeling, simulation of dynamical systems, Bayesian inference.
- HPC environments (SLURM), parallel computation, and 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.