Pedro Fontanarrosa

Multidisciplinary Researcher & Software Engineer | Statistical Modeling & Data Standards | pfontanarrosa@gmail.com | +1 530-277-7641 | Nevada City, US | fontanapink.github.io/Resume-PedroFontanarrosa/

Summary

Multidisciplinary researcher with extensive experience in computational/software engineering and biological sciences with 7+ years executing end-to-end statistical workflows: experimental design support, analysis plan writing, data standards adoption, reproducible programming, and rigorous QC. Deep experience building analysis datasets and publication-grade TLFs in Python/R. Comfortable translating complex methods for non-statisticians and coordinating with cross-functional teams across US/UK time zones.

Skills

- **Biostatistics & Clinical Standards**: Study design (hypotheses, endpoints, estimands), SAP/analysis plan writing (methods, assumptions, sensitivity), TLFs (tables, listings, figures) — design & QC (Python/R), CDISC concepts (SDTM/ADaM) — mapping familiarity (self-study), Regulatory awareness (ICH E9/E6(R2), GCP, 21 CFR Part 11), Data integrity & audit trails; traceable derivations
- **Programming**: Python, R, PyMC, NumPy/SciPy, pandas, Matplotlib, JAX/TensorFlow, scikit-learn, Git/GitHub, Docker, CI/CD, Java, C++, JavaScript, R, Git, GitHub, GitLab, CI/CD, Docker, Kubernetes, Google Cloud, TensorFlow, PyTorch, scikit-learn, MCP, WSL
- **Optimization & Operations Research**: CPLEX, Gurobi, Pyomo, Linear Programming, Nonlinear Programming, Integer Programming
- **Web Scraping**: Scrapy, Splash, Selenium
- **Methods & Modeling**: Bayesian inference, Gaussian Processes, Mixed models, Time-to-event basics, Artificial Intelligence, Deep Learning, Hybrid Neural Networks, Physics-Informed Neural Networks, Bayesian Inference, Gaussian Process Regression, Time Series Analysis, VAR Regression, Uncertainty Quantification, PyMC, Multiple imputation basics, UQ (ensembles, dropout)
- **Additional Technical**: HPC & cluster computing, Job scheduling, Parallel/Distributed computing, SQL (intermediate), Web scraping (Scrapy/Selenium), Web (HTML, Hugo, Jekyll)

Work Experience

Computational Systems & Synthetic Biology Lab, University College London **London, UK**
Postdoctoral Researcher (Statistical Modeling & Inference) Jun 2023 — Present

- Designed study analysis plans for modeling investigations; specified model/estimator choices, priors, and sensitivity analyses; delivered publication-ready TLFs with traceable code and logs.
- Built and validated pipelines to transform raw, multi-omic time series into analysis datasets; implemented data integrity checks, missing-data imputation, and derivations with unit-tested functions.
- Led uncertainty-quantification work (ensembles, MC-dropout); documented assumptions, diagnostics, and limitations in methods sections.
- Instituted CI/CD and code review practices for reproducible analyses; authored programming/QC rules and tracking logs shared with collaborators.
- Presented methods and results to mixed technical/non-technical audiences; collaborated across US/UK time zones.

Genetic Logic Lab, University of Colorado Boulder **Boulder, CO, USA**
Postdoctoral Researcher (Modeling & Data Standards) Aug 2022 — Jun 2023

- Developed statistical models to evaluate design robustness under noise/uncertainty; created comparison TLFs and figures for decision-making and manuscripts.
- Contributed to community data/metadata standards (SBOL/SBML/SED-ML) and automated model generation; emphasized traceability and auditability.
- Collaborated with cross-disciplinary teams; maintained project administration files (protocol-like documents, analysis notes, annotated shells, communication logs).

University of Utah **Salt Lake City, UT, USA**
Research Assistant (PhD & MS) Aug 2017 — Aug 2022

- Designed and executed statistical modeling studies; ran simulation studies to assess estimator performance and robustness; documented SAP-like methods and results.
- Built data processing/analysis pipelines; QA/QC via unit tests, reproducible environments, and version-controlled analysis notebooks.
- Mentored peers on experimental design, uncertainty analysis, and communicating results.

COMBINE Standards (SBOL Community) **Remote**
SBOL Standards Editor / Contributor Jan 2019 — Jan 2022

- Contributed to open standards (SBOL v3) enabling structured protocols, annotations, and machine-readable model/metadata exchange.
- Drafted and reviewed specification text; coordinated cross-institution contributors; emphasized validation rules and backward compatibility.

Data-Centric Biological Design & Engineering Interest Group (Alan Turing Institute)
Organizer / Program Coordinator (Part-time)
Remote, UK/US time zones
Oct 2024 — May 2025

- Coordinated a monthly seminar series with speakers from academia and industry; owned agendas, logistics, and stakeholder communications across US/UK time zones.
- Maintained project administration artifacts (speaker intake, schedules, tracking logs, website/calendar updates) with version control and auditability.
- Standardized templates/checklists to improve quality and consistency of abstracts, slides, and summaries; ensured materials were accurate and audience-appropriate.
- Built cross-functional relationships and collaborated with scientists, data engineers, and program staff to define talk scope and outcomes.

Education

University of Utah Aug 2019 — Aug 2022
Ph.D. in Biomedical Engineering
- 3.8/4.0

University of Utah Aug 2017 — Aug 2019
Master's in Bioengineering
- 3.67/4.0

University of Buenos Aires Jan 2007 — Jan 2014
Licentiate in Biological Sciences
- 8.39/10.00

Profiles

GitHub *fontanapink*	github.com/Fontanapink	**ORCID** *0000-0002-0535-2684*	orcid.org/0000-0002-0535-2684
Google Scholar *Pedro Fontanarrosa*	scholar.google.com/citations?hl=en&user=UemPJnYAAAAJ	**Research Gate** *Pedro Fontanarrosa*	www.researchgate.net/profile/Pedro_Fontanarrosa3?ev=hdr_xprf

LinkedIn *Pedro Fontanarrosa* www.linkedin.com/in/pedro-fontanarrosa-37372474/

Certifications

- **Data Science Bootcamp** : THE ERDŐS INSTITUTE
- **Machine Learning A-Z™: AI, Python & R + ChatGPT Bonus [2023]** : Udemy
- **Optimization with Python: Solve Operations Research Problems** : Udemy
- **Optimization with Python: Complete Pyomo Bootcamp A-Z** : Udemy
- **AI and Meta-Heuristics (Combinatorial Optimization) Python** : Udemy
- **Modern Web Scraping with Python using Scrapy Splash Selenium** : Udemy
- **Deployment of Machine Learning Models** : Udemy
- **Pyomo Bootcamp: Python Optimization from Beginner to Advance** : Udemy
- **Theory of Gaussian Process Regression for Machine Learning** : Udemy

Projects

MIMIC — Modeling & Inference of Microbiomes (Python)
Open-source package integrating simulation (gLV/VAR/CR), Bayesian inference, and uncertainty quantification; examples as Jupyter notebooks; reproducible workflows and documentation.

[github.com/ucl-cssb/MIMIC]

PINN for Dynamics Inference
Physics-informed neural networks to infer interpretable interaction parameters; ablation studies and uncertainty quantification with deep ensembles and MC-dropout; comprehensive diagnostics.

Awards & Recognitions

- **Fulbright and Argentine Presidential Fellowship in Science & Technology**: Awarded to pursue a master's degree in the United States starting Fall 2017.
- **Research and Communication Excellency Award**: Recognized for excellence in research and communication under the 'Beca Estímulo' scholarship.
- **Beca Estímulo (Encouragement Scholarship)**: Supported research and development tasks in genetics and ecology.