Younes Boulaguiem
Ph.D. in Statistics

Contact Information

✉ Younes.Boulaguiem@gmail.com

🏠 Based in Geneva

🌐 www.younesboulaguiem.com

🌐 Work Permit B (until 2029)

Short Bio

Ph.D. in Statistics experienced in biostatistics, computational methods, and modern modeling approaches including Bayesian and machine learning techniques. Published author and open-source contributor, experienced in supporting interdisciplinary teams across research and applied domains. Strong communicator who thrives at the intersection of data, strategy, and impact.

Professional Experience

Research Fellow in Statistics   2019, August - 2025, August
Research Center for Statistics, University of Geneva, Switzerland

- Spearheaded **3 novel statistical methods** for **bioequivalence testing**, published in *Statistics in Medicine* (2 first-author articles); **Directly applicable**, it offers **improved power** and **accuracy** (size-α tests and over 15% gain in power), enabling significant **trial cost savings**. Implemented in an **R package** with **3200+ downloads** within year one. This work laid the foundation for a **CHF 1.5 million research grant**, supporting translational projects at the intersection of statistics and pharmaceutical development, with particular focus on adaptive designs.
- Created **evtGAN**, a **generative AI model** for simulating spatial extremes from as few as 30 observations; published in *Environmental Data Science* (first-author). Delivers **fast** (hours vs. years) and **scalable** compound modeling. **Open-source R/Python** implementation with **700+ consultations**.
- Designed **simulation-based inference** methods under **differential privacy**, achieving near **non-private performance**; our contribution provides a lean and powerful solution to conduct statistical inference that **enables data sharing under privacy**, crucial for **cross-institutional collaboration and discovery**.
- Contributed statistical expertise and **high impact visualizations** across diverse research projects, resulting in **7+ publications**; built **R Shiny dashboards** for complex drug data and delivered **10+ presentations** at seminars and conferences, **translating complex research** into clear insights for all audiences.

Ph.D. Intern in Statistics   2025, February - May
Roche, Product Development, Basel Headquarters, Switzerland

- Developed **advanced modeling approaches** to replace conventional disability scores in neuroinflammatory diseases using **Item Response Theory**, **Bayesian hierarchical modeling** and **machine learning**; achieved $\geq$**15% gain in statistical power**, enabling **reduction of 250+ participants** per trial (for the same achieved empirical power). Results support **more efficient Phase II trial** designs and **informed decision-making in Phase III** regarding continuation, duration, and cost.
- Participated in **cross-functional** meetings on **ongoing clinical trials** and supported data curation to ensure accuracy, consistency, and compliance.
- Completed **Good Clinical Practice (GCP)** training and built on my prior experience with **FDA** and **EMA** bioequivalence guidelines from my PhD, gaining a clearer view of how regulatory frameworks shape statistical practice in clinical development.

Teaching Assistant   2018, February - 2025, January
University of Geneva, Switzerland

- **Assisted teaching and curriculum development** in mathematics, probability and statistics, including **5+ years** teaching *Mixed Linear Models* at the graduate level; consistently received **top-ranked student evaluations**, leading to the contribution of **digital training materials**, including an **interactive e-book** and private R **tutorial videos** on [YouTube](#), originally created for graduate students, later used to support internal training.

EDUCATION

Ph.D. in Statistics   2019, August - 2025, August
University of Geneva, Switzerland

- Thesis Title: "*Contributions to Equivalence Testing.*" Advisors: Prof. Maria-Pia Victoria-Feser & Prof. Stéphane Guerrier.
- Research interests: Bioequivalence, Simulation-based Inference, Generative AI, Differential Privacy, Extreme Value Theory.

M.Sc. in Statistics   2016, September - 2019, February
University of Geneva, Switzerland

- Thesis Title: "*Learning Max-stable Distributions with Generative Adversarial Networks.*" Advisor: Prof. Sebastian Engelke.

B.Sc. in Economics & Management   2013, September - 2016, June
Haute Études Commerciales, University of Lausanne, Switzerland

- Focus: Economics, Statistics, Probability, Econometrics, Finance, Business acumen.

OPEN SOURCE

"cTOST" - R package: implements the TOST and cTOST corrective procedures proposed in [6] (see 'Publications' Section below) to conduct (bio)equivalence testing. Available in CRAN. More information and access: <https://yboulag.github.io/cTOST/>.

"Temperature and Precipitation maxima" - Zenodo repository: contains large ensemble simulated data of the annual temperature and precipitation maxima across Western Europe for 2000 years, with the R and Python code to implement the "evtGAN" model (using Tensorflow) proposed in [3] (see 'Publications' Section below).
More information and access: <https://zenodo.org/records/5821485>.

SKILLS

Statistical Modeling & Analysis: Regression Analysis, Mixed Models, Hypothesis Testing, Equivalence Testing, Time Series Analysis, Generalized Linear Models, Monte-Carlo Simulations, Sample Size Calculation, Power Analysis, Clustering, Multivariate Analysis, Bayesian Statistics, Experimental Design, Nonparametric Methods, Simulation-based Methods, Differential Privacy, Latent Variable Models, Causal Inference, Survival Analysis, Missing Data Imputation.

Machine Learning & AI: Generative AI, Regression, Classification, Deep Learning, Natural Language Processing, Computer Vision, Reinforcement Learning, Model Evaluation, Feature Engineering.

Programming & Software: R, Python, Bash, SQL, Javascript, Stan, C++, Shiny, Git, Shell, HPC, AWS, Markdown, Tensorflow, Keras, PyTorch, scikit-learn, pandas, numpy, scipy, ggplot2, matplotlib, seaborn, plotly, Excel, Microsoft Office.

Languages: Arabic (Native), French (Native), English (C2).

OTHER INTERESTS

Outside of work, I enjoy surfing in the summer and cold plunging in the winter. I play the electric guitar in a small band of friends, love riding my motorbike and enjoy playing football.

REFERENCES

Letter of Recommendation Available upon Request

PD Dr Ulrike Bonati MD, Senior Medical Director & Clinical Science Leader, Roche Basel Headquarters, Switzerland, ulrike.bonati@roche.com.

Hans-Martin Schneble MD MBA, Global Development Leader Multiple Sclerosis, Roche Basel Headquarters, Switzerland, hans-martin.schneble@roche.com.

Prof. Maria-Pia Victoria-Feser, Full Professor of Statistics, University of Geneva, Switzerland, Maria-Pia.VictoriaFeser@unige.ch.

Prof. Stéphane Guerrier, Associate Professor of Statistics, University of Geneva, Switzerland, Stephane.Guerrier@unige.ch.

Prof. Thomas Jaki, Professor of Statistics/Program Leader at the Medical Research Council Biostatistics Unit, University of Cambridge, UK, Thomas.Jaki@informatik.uni-regensburg.de.

Dominique-Laurent Couturier, Senior Research Associate at the Medical Research Council Biostatistics Unit, University of Cambridge, UK, dominique.couturier@mrc-bsu.cam.ac.uk.

PUBLICATIONS

9. Ogonnaya, M. R., **Boulaguiem, Y.**, Molinari, R., *"Fiducial Matching: Differentially Private Inference for Categorical Data"*, arXiv, 2025.

8. Insolia, L., Ma, Y., **Boulaguiem, Y.**, Guerrier, S., *"Bioequivalence Assessment for Locally Acting Drugs: A Framework for Feasible and Efficient Evaluation"*, arXiv, 2025.

7. **Boulaguiem, Y.**, Insolia, L., Victoria-Feser, M.-P., Couturier D.-L., Guerrier, S., *"Multivariate Finite-Sample Adjustments for Equivalence Testing"*, Statistics in Medicine, Wiley, 2025.

6. **Boulaguiem, Y.**, Quartier, J., Lapteva, M., Kalia, Y. N., Victoria-Feser, M.-P., Guerrier, S., Couturier D.-L., *"Finite Sample Corrections for Average Equivalence Testing"*, Statistics in Medicine, Wiley, 2024.

5. Santos, B., **Boulaguiem, Y.**, Baysson, H., Pullen, N., Guessous, I., Guerrier, S., Stringhini, S., Schneider, M. P., *"Patient-Perceived Impact of the COVID-19 Pandemic on Medication Adherence and Access to Care for Long-Term Diseases: A Cross-Sectional Online Survey"*, COVID, 2024.

4. Quartier, J., Lapteva, M., **Boulaguiem, Y.**, Guerrier, S., Kalia, Y. N., *"Influence of Molecular Structure and Physicochemical Properties of Immunosuppressive Drugs on Micelle Formulation Characteristics and Cutaneous Delivery"*, Pharmaceutics, 2023.

3. **Boulaguiem, Y.**, Zscheischler, J., Vignotto, E., van der Wiel, K., Engelke, S, *"Modeling and Simulating Spatial Extremes by Combining Extreme Value Theory with Generative Adversarial Networks"*. Environmental Data Science, Cambridge University Press, 2022.

2. Faul, M. V., **Boulaguiem, Y.**, *"Faultlines within Sectors in Partnership Executive Boards"*, Partnerships for Sustainability in Contemporary Global Governance, Routledge, 2022.

1. Quartier, J., Lapteva, M., **Boulaguiem, Y.**, Guerrier, S., Kalia, Y. N., *"Polymeric Micelle Formulations for the Cutaneous Delivery of Sirolimus: A new Approach for the Treatment of Facial Angiofibromas in Tuberous Sclerosis Complex"*. International Journal of Pharmaceutics, 2021.

TALKS
(MORE HERE)

"Differentially Private Just Identified Indirect Estimator", 2023 Data Analytics Lab Workshop in Ovronnaz, Switzerland. More information: `https://dal-workshop.netlify.app/`.

"Univariate Equivalence Testing with Finite Sample Adjustments", 2023 Conférence Universitaire de Suisse Occidentale. More information: `https://statistique.cuso.ch/activites`.

"A General Testing Approach for Bioequivalence in Multivariate Settings", Roundtable leader at the 2021 ASA Biopharmaceutical Section Regulatory-Industry.