



Mélanie Guhl

Paris, France

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Professional experience

- 2025  **Junior Statistical Methodologist, Saryga, remote, France**
Statistical expertise to support innovation and decision-making in healthcare
- 2024  **Postdoctoral researcher, Aalto University, Helsinki, Finland**
Supervisor: Pr Aki Vehtari
Probabilistic Machine Learning Group, Finnish Center for Artificial Intelligence, Computer Science Department
- 2020 – 2024  **Ph.D in Biostatistics and Biomathematics, Université Paris Cité, France**
Development of statistical methods to measure treatment effects with mixed effects models on clinical trials with sparse design
 - Developed a semi-Bayesian computation method of standard errors in non linear mixed effects models
 - Applied and evaluated this new method on simulation studies
 - Supervised an internship on variations of this semi-Bayesian method and application on more complex simulated and real data
 - Developed a code extension to the saemix package
- 2020  **Six Months Internship, BIPID , IAME, UMR 1137 INSERM, Hôpital Bichat, Paris**
Statistical approaches for pharmacokinetic bioequivalence studies on sparse design, in collaboration with the FDA
- 2019  **Three Months Internship, Unité de Méthodologie et Biostatistiques, CHU and Université Lille**
Performance analysis of the cardio-vascular risk score ESC-SCORE on the women French cohort E3N, use of survival and mixed models
- 2018  **Four Weeks Internship, B&B Broadford House, Ile of Skye, Scotland**
- 2015  **Six Weeks Internship, Accounting Department of Fives DMS, Seclin**

Teaching assistant experience

- 2021 – 2024  **Dynamic Models - Ordinary Differential Equations**
M.Sc. SMSDS (Statistics, Modeling and Data Science in Health) , Sorbonne Université, Paris, France
Coordinators: Dr Julie Bertrand, Dr Cédric Laouénan, Dr Jérémie Guedj
- 2022 – 2023  **Linear regression**
2nd year engineering school, ENSAI, Rennes, France
Professor : Dr Basile De Loynes
- 2020 – 2022  **Introduction to Biostatistics**
Biomedical Sciences Bachelor, Université Paris Cité, France
Introduction in 2nd year and optional complementary course in 3rd year
Professors: Dr Virginie Lasserre, Dr Emmanuel Curis

Education

- 2020 – 2024  **Ph.D in Biostatistics and Biomathematics, Université Paris Cité, France**
Doctoral school ED393 Pierre Louis de Santé Publique
Thesis title: *Computation of uncertainty at finite distance in nonlinear mixed effects models*
Director: Dr Emmanuelle Comets, co-supervisor: Dr Julie Bertrand
Lab: BIPID team, IAME, Inserm UMR1137, Paris, France (Director: Pr France Mentré)
Funded by Université Paris Cité 3 years doctoral contract
- 2020  **M.Sc. Fundamental Mathematics, Université Rennes, France**
Specialisation in Aleatory - Optional parallel degree with Ensai, research oriented
- 2017 – 2020  **M.Sc. Statistical Engineering, ENSAI, Rennes, France**
Specialisation in Biostatistics
- 2014 – 2017  **Bachelor Applied Mathematics and Social Sciences (MASS), Université Lille, France**
- 2013 – 2014  **First Year of Medical Studies (PACES), Université Lille, France**
Ranked 29/2317

Attended courses

- 2023  **Summer School in Advanced Bayesian methods** Leuven, Belgium
Bayesian Workflow for hierarchical and ODE-based models using Stan (3 days)
given by Dr Charles Margossian from Flatiron Institute, NY
- 2022  **Uppsala Pharmacometrics Summer School** Uppsala Universitet, Sweden
Introduction to pharmacometrics modeling in NONMEM (2 weeks)
given by Uppsala Pharmacometrics Research Group led by Pr Mats Karlsson

Publications

- 1 L. Fayette, J. Bertrand, E. Comets, and **M. Guhl**, “Development of a semi-bayesian SAEM algorithm for finite-distance estimation of parameter uncertainty in nonlinear mixed-effects models,” *Under review*.
- 2 **M. Guhl**, J. Bertrand, L. Fayette, F. Mercier, and E. Comets, “Uncertainty computation at finite distance in nonlinear mixed effects models - a new method based on metropolis hastings algorithm,” *The AAPS Journal*, vol. 26, no. 3, p. 53, 2024.  DOI: 10.1208/s12248-024-00905-x.
- 3 **M. Guhl**, F. Mercier, C. Hofmann, *et al.*, “Impact of model misspecification on model-based tests in PK studies with parallel design: Real case and simulation studies,” *J Pharmacokinet Pharmacodyn*, vol. 49(5), pp. 557–577, 2022.  DOI: 10.1007/s10928-022-09821-z.
- 4 F. Gao, C. Languille, K. Karzazi, **M. Guhl**, B. Boukebous, and S. Deguen, “Efficiency of fine scale and spatial regression in modelling associations between healthcare service spatial accessibility and their utilization,” *International Journal of Health Geographics*, vol. 20, no. 1, 2021.  DOI: 10.1186/s12942-021-00276-y.

Dissemination

- 2024  **ISCB Meeting, Thessaloniki, Greece**
Poster: "Semi-Bayesian methods to compute standard errors in nonlinear mixed effects models for sparse data", L. Fayette, J. Bertrand, E. Comets, **M. Guhl**
-  **Rencontres R, Vannes, France**
Oral presentation: "Mise en oeuvre de méthodes semi-Bayésiennes de calcul des erreurs standards pour les données éparées dans le package saemix" **M. Guhl**, L. Fayette, J. Bertrand, E. Comets, <https://rr2024.sciencesconf.org/544031>
-  **Division of Systems Pharmacology and Pharmacy (SPP), Leiden Academic Centre for Drug Research (LACDR), Leiden University, Netherlands**
Invited seminar: "Computation of parameter uncertainty at finite distance in nonlinear mixed effects models", **M. Guhl**, J. Bertrand, E. Comets
- 2023  **Bayesian Modeling Research Group, Finnish Center for Artificial Intelligence (FCAI), Aalto University, Finland**
Invited seminar: "Computation of parameter uncertainty at finite distance in nonlinear mixed effects models", **M. Guhl**, J. Bertrand, E. Comets
-  **Pharmacometrics in France, Paris, France**
Oral presentation: "Computation of parameter uncertainty at finite distance in nonlinear mixed effects models", **M. Guhl**, J. Bertrand, E. Comets
-  **ISCB Meeting, Milan, Italy**
Poster: "Uncertainty computation at finite distance in nonlinear mixed models: evaluation of a new Bayesian method", **M. Guhl**, J. Bertrand, E. Comets
-  **PAGE Meeting, A Coruña, Spain**
Poster: "Uncertainty computation at finite distance in nonlinear mixed effects models - a new method evaluated on simulations and applied to the evolution of clinical status of patients hospitalised for COVID-19", **M. Guhl**, J. Bertrand, J. Guedj, F. Mentré, E. Comets, <https://www.page-meeting.org/default.asp?abstract=10528>
- 2022  **PAGE Meeting, Ljubljana, Slovenia**
Poster: "Computation of standard errors at finite distance in non linear mixed effects models", **M. Guhl**, J. Bertrand, E. Comets, <https://www.page-meeting.org/default.asp?abstract=10152>
- 2021  **PAGE Meeting, Online**
Poster: "Model-based analysis of PK equivalence: assessing the impact of model misspecification", **M. Guhl**, F. Mercier, S. Sharan, K. Feng, G. Sun, W. Sun, M. Donnelly, S. Grosser, L. Zhao, L. Fang, F. Mentré, E. Comets, J. Bertrand, <https://www.page-meeting.org/default.asp?abstract=9719>
-  **ISCB Meeting, Online**
Poster: "Impact of model misspecification on model-based bioequivalence", **M. Guhl**, F. Mercier, S. Sharan, K. Feng, G. Sun, W. Sun, M. Donnelly, S. Grosser, L. Zhao, L. Fang, F. Mentré, E. Comets, J. Bertrand
-  **Journées de Statistiques, SFDS, Online**
Oral presentation: "Tests d'équivalence pharmacocinétique par modélisation : impact d'une mauvaise spécification du modèle", **M. Guhl**, J. Bertrand, E. Comets
- 2020  **Journées de Biostatistiques, SFDS, Paris, France**
Oral presentation: "Approches statistiques par modélisation pour les études de bioéquivalence pharmacocinétique avec données éparées", **M. Guhl**, J. Bertrand, E. Comets

Skills

- Languages  French : native language
English : strong reading, writing and speaking skills (TOEIC 985/990 in 2018)
Spanish : intermediate reading, writing and speaking skills
Japanese : beginner
Finnish : beginner
- Software  R, stan, Monolix, WinBUGS, Scilab, SQL, SAS, $\LaTeX$, Office Suite

Miscellaneous

- 2025  **Alpha15, literacy association, Paris, France**
Provided French courses for non-native people aiming to pass official exams
Academic support for children of the association beneficiaries in need of help
- 2017 – 2019  **Ensai Junior Consultant, Junior Enterprise of Ensai, Rennes, France**
Accountant, Project Chief Assistant, and Auditor
Managed accounting of EjC for one year in 2018 : entries, closing and budget tracking
(annual turnover : 50 000 euros)
Audited treasury of other junior enterprises for the National Confederation of Junior Enterprises (IMT Atlantique Nantes, Sorbonne Paris)
- 2013 – 2019  **Private tuition in Mathematics and Physics**
Guided approx. 10 middle and high school students in personal work on a weekly basis,
provided individual learning plans for students in difficulty