
About

Biostatistician with 10+ years of experience across academic research with expertise in Bayesian statistical modeling, linear mixed models, study design, statistical analysis planning, modeling and simulation, and cross-functional collaboration. Proficient in R and SAS, with a strong track record of delivering high-quality statistical analyses and communicating complex results to diverse scientific and non-scientific audiences.

Experience

- 06/2022 – present **Biostatistics Scientist**, *Bayer Crop Science*, Monheim am Rhein, Germany
- Provide statistical expertise for regulated R&D projects, supporting study design, analysis planning, data analysis, and interpretation of results in cross-functional teams.
 - Design and optimize studies through simulation-based approaches, including power analysis and model-based evaluation of design assumptions, supporting robust and efficient decision-making.
 - Develop and contribute to statistical analysis plans and ensure reproducible analytical workflows to support high-quality and traceable results.
 - Lead cross-functional statistical discussions, translating scientific questions into statistical methodologies and communicating results to support regulatory and strategic decisions.
 - Contribute to standardization of statistical processes and quality standards across projects, including oversight of outsourced analytical work.
- 10/2021 – 03/2022 **Post-Doctoral Researcher**, *Research Institute for Farm Animal Biology*, Dummerstorf, Germany
- Provided statistical consulting to researchers, supporting study design, analysis planning, and interpretation of results.
 - Applied advanced statistical methods (e.g., GLMMs, simulations) to ensure robust and reproducible analyses.
 - Communicated statistical results to non-statistical collaborators, supporting evidence-based decision making.
- 02/2016 – 08/2021 **Research associate**, *Jacobs University Bremen*, Bremen, Germany
- Developed and applied advanced statistical and Bayesian models to complex biological systems, including parameter estimation, uncertainty quantification, and model validation.
 - Designed reproducible analytical workflows using R and Stan, ensuring transparency and traceability of results.
 - Collaborated with experimental scientists to translate biological hypotheses into quantitative frameworks and statistical analyses (e.g., PCA, ANOVA, GLMM).

Early Career Experience

- 11/2012 – 08/2013 **Environmental statistical analyst**, *Instituto Nacional de Estadística y Censos*, Quito, Ecuador
- Survey design aimed at industry, households and sectional government for construction of a national general database based on the Framework for Development of Environmental Statistics proposed by United Nations.
- 03/2011 – 11/2012 **Chemistry teacher**, *Unidad Educativa San Gabriel*, Quito, Ecuador
- Advanced Chemistry class for senior students with a major in Sciences.
- 07/2010 – 01/2011 **Technical assistant**, *Soluciones Ambientales Totales*, Quito, Ecuador
- Teacher of Environmental Education seminars about waste classification and disposal in several high schools of Quito.
- 03/2010 – 06/2010 **Independent consultant**, *GTZ, Deutsche Gesellschaft für Technische Zusammenarbeit*, Quito, Ecuador
- Collection and analysis of data about the status of biotechnology, GMOs and biosafety in Ecuador.

Education

- 02/2016 – 08/2021 **PhD in Bioinformatics**, *Jacobs University Bremen*, Germany
- Thesis: "Mathematical modelling of cocoa bean fermentation processes"

- 09/2013 – 09/2015 **MSc in Statistics**, *Catholic University of Leuven*, Belgium, *Cum laude distinction*
Thesis: "Four-Level Meta-Analysis: A comparison with Three-Level Meta-Analysis"
- 09/2003 – 04/2010 **BSc in Biotechnology**, *Escuela Politécnica del Ejército*, Ecuador, *GPA 17.9/20*
Thesis: "Urban waste-water treatment through the use of native *cyanobacteria* from the *Polylepis pauta* forest of Papallacta – Ecuador"

Statistical Methodology and Regulatory Experience

- Extensive experience with linear mixed models and GLMMs for variability analysis, stability studies, and repeated measures data in regulated environments.
- Experience developing statistical analysis plans for complex studies in regulated R&D environments.
- Familiarity with CDISC data standards and clinical trial regulatory frameworks through Johns Hopkins Clinical Trials Operations Specialization.
- Applied modeling and simulation for study design and decision criteria development.

Programming and Software skills

R	Expert	Stan	Advanced
Quarto	Advanced	RShiny	Intermediate
SAS	Intermediate	SQL	Intermediate
JMP	Intermediate		

Languages

Spanish	Native speaker	English	Full professional proficiency
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Teaching & Scientific Communication

- 04/2023 – Present **Lecturer (Volunteer)**, *Various Institutions*, Quito, Ecuador
- Designed and delivered advanced Statistics and R programming courses (40+ hours) for interdisciplinary scientific audiences, focusing on translating complex statistical concepts into decision-oriented frameworks.

Publications

- [1] Langbein, J., **Moreno-Zambrano, M.**, and Siebert, K. How do goats "read" 2D-images of familiar and unfamiliar conspecifics?. *Frontiers in Psychology*, 14, 2023. (doi.org/10.3389/fpsyg.2023.1089566)
- [2] **Moreno-Zambrano, M.**, Ullrich, M. S., and Huett, M-T. Exploring cocoa bean fermentation mechanisms by kinetic modelling. *Royal Society Open Science*, 9(2), 2022. (doi.org/10.1098/rsos.210274)
- [3] Megias-Perez, R., **Moreno-Zambrano, M.**, Behrends, B., Corno, M., and Kuhnert, N. Monitoring the changes of low molecular weight carbohydrates in cocoa beans during spontaneous fermentation: a chemometric and kinetic approach. *Food Research International*, 2019. (doi.org/10.1016/j.foodres.2019.108865)
- [4] **Moreno-Zambrano, M.**, Grimbs, S., Ullrich, M. S., and Huett, M-T. A mathematical model of cocoa bean fermentation. *Royal Society Open Science*, 5(10), 2018. (doi.org/10.1098/rsos.180964)
- [5] Flores, F. J., Marek, S. M., Anderson, J. A., Mitchell, T. K., **Moreno-Zambrano, M.**, and Walker, N. R. Reactive oxygen species production and alternative hosts of spring dead spot-causing fungi. *International Turfgrass Society and ACSESS*, 13:213–224, 2017. (doi.org/10.2134/itsrj2016.06.0480)