Marco Antônio de Amorim Peixoto
Phone: + 1 (352) 871-7239
Email: marco.peixotom@gmail.com
URL: https://marcopxt.github.io/

Last update: 12-01-2023

Summary

I am a creative and self-motivated scientist with a solid foundation in the theoretical and practical aspects of quantitative genetics, predicting breeding, breeding program simulation, and linear mixed models. I generate data-driven evidence for the enhancement of genetics and breeding purposes, relying on statistics and genetic data.

Education

2023 **Ph.D. in Genetics and breeding. Federal University of Viçosa – Brazil**
Dissertation: Applying quantitative genetics tools to breeding program optimization
Advisor: Dr. Leonardo L. Bhering

2016 **M.Sc. in Animal Biology. Federal University of Viçosa – Brazil**
Thesis: Biogeography and conservation of the anurofauna in the Mantiqueira mountain range.
Advisor: Dr. Pedro S. Romano

2014 **B.S. in Biology Science. Federal University of Viçosa – Brazil**
Project title: The karyotypes of five species of the *Scinax perpusillus* group.
Advisor: Dr. Jorge Abdala Dergam

Experience

April 2023 to present
University of Florida, USA
Postdoctoral associate at Sweet Corn Breeding and Genomics Lab. Supervisor: Dr. Márcio Resende.
- Mate allocation of breeding crosses, via package development.
  Implementation of usefulness prediction.
  Development of optimization algorithms.
- GWAS analyses for uncovering genetic basis of disease resistance in sweet corn
- Imputation of low-density marker data in Sweet Corn panel.

Aug 2021 to March 2023
University of Florida, USA
Visiting Research Scholar at Sweet Corn Breeding and Genomics Lab. Supervisor: Dr. Márcio Resende.
- Planning and optimization of the breeding program via stochastic simulations
- Genetic data analyses (modelling, genomic prediction, and selection)
- Hybrid prediction under G×E interaction for recommendation purposes
- Development of cross-prediction (mean, variance, and usefulness) algorithms and mate allocation optimization.
- Multidisciplinary activities through cross-functional teams.
  Functional biology: Identification GWAS hits for posterior functional identification.
  Evolutionary biology: Modelling, prediction/estimation of BLUEs/BLUPs and heritabilities for evolutionary studies.
- Nursery activities at sweet corn breeding program (phenotyping, selfing, crossing, and selection)

Jan 2021 to Mar 2022
GenMelhor, Federal University of Viçosa, Brazil
Scientific coordinator, at Genetics and Breeding study group
- Coordination of the scientific sector of the study group, with emphasis on the promotion of events for the students from the genetics and breeding program and related areas
- Working collaboratively with the team for symposiums, workshops, and short courses organization for students
- Implementation of a podcast (Geneticast) in genetics and breeding

Mar 2019 to Mar 2023
Federal University of Viçosa, Brazil
Graduate research assistant, at Biometry Laboratory (under Dr. Leonardo L. Bhering guidance) as part of the PhD, in Federal University of Viçosa, Viçosa, MG, Brazil.
- Development of statistical genetics approaches with emphasis on modeling, prediction, and selection.
- Teaching short courses to companies, students, and professionals regarding mixed models, statistics, and plant breeding.
- Working collaboratively on the discussion and implementation of genetic assessment and breeding.

Jun 2016 to Jan 2017
Institute of Technology of Minas Gerais State, Brazil
Teaching Assistant
- Teaching classes for undergrads students from Agronomy and correlated areas.

Mar 2014 to Feb 2016
Federal University of Viçosa, Brazil
Graduate research assistant at biological data analysis Laboratory. Supervisor Dr. Pedro S. Romano
- Definition of singular areas in species distribution from Mantiqueira mountain range region as surrogates to define target areas for conservation and protection.

Aug 2012 to Feb 2014
Federal University of Viçosa, Brazil
Fellowship intern, at Molecular Biology laboratory. Supervisor Dr. Jorge Abdala Dergam
- Development of molecular methods for genome sequencing and cytogenetics studies.
- Description of karyotypes of species and populations through classic and molecular techniques.

Skills

Genetics: genomic prediction, quantitative genetics, breeding simulation.
Statistical: Analyses of genetic and agricultural data, linear mixed models, Bayesian inference.
Programming and software: R (advanced), R Shiny App development (intermediate), shell/bash, ASReml-R, BLUPF90 family, Git version control system (GitHub), RMarkdown/Quarto, and C++/Python (basic knowledge).
Soft Skills: Effective communication, Empathy, Fast adaptation, Team Player, Leadership.

Journal articles

2023 Peixoto, MA, Amadeu RR, Bhering, LL, Munoz, PR, Ferrao, LF, Resende, M. SimpleMating: R-package for prediction and optimization of breeding crosses using genomic selection. In prep.

2023 Peixoto, MA, Coelho, I, Leach, K, Bhering, LL, Resende, M. Simulation-Based Decision Making and Implementation of Tools in Hybrid Crop Breeding Pipelines. Crop Science.

2023 Peixoto, MA, Leach, K, Jarquin, D, Flannery, P, Zystro, J, Tracy, W, Bhering LL., Resende, M. Utilizing genomic prediction to boost hybrid performance in a sweet corn breeding program. Submitted.

2023 Santana A, Marçal T, Salvador F, Souza M, Silva L, Silva B, Peixoto, MA, Carneiro P, Carneiro J. Analysis of advanced generation multistage field trials data in autogamous plant breeding: An evaluation in common Bean. Crop Science, 2023.

2023 Evangelista J, Peixoto, MA, Coelho I, Ferreira F, Marçal T, Alves R, Chaves S, Rodrigues E, Laviola B, Resende M, Dias K, Bhering L. Modeling covariance structures and optimizing Jatropha curcas breeding. Tree Genetics & Genomes. 2023 Apr;19(2):21.

2023 Malikouski R, Alves R, Peixoto MA, Ferreira F, do Nascimento E, de Morais A, Zucoloto M, Dias K, Bhering L. Selection index based on random regression model in 'Tahiti'acid lime. Euphytica.

2022 Santos I, Peixoto MA, Cruz C, Ferreira R, Nascimento M, Rosado R, Sant'Anna I. A novel approach to determine tropical persistence on alfalfa germplasm. Agronomy Journal.

2022 Marinho C, Coelho I, Peixoto MA, Junior G, Resende M. Genomic Selection As A Tool For Maize Cultivars Development. Revista Brasileira De Milho E Sorgo.

2021 Ferreira F, Rodrigo V, Malikouski R, Peixoto MA, Bernardeli A, Alves R, Magalhães-Jr W, Andrade R, Bhering L, Machado J. Bioenergy Elephant Grass Genotype Selection Leveraged by Spatial Modeling of Conventional and High-Throughput Phenotyping Data. Journal of Cleaner Production.

2021 Peixoto MA, Evangelista J, Coelho I, Carvalho L, Farias F, Teodoro P, Bhering L. Genotype selection based on multiple traits in cotton crops: the application of genotype by yield*trait biplot. Acta Scientiarum-Agronomy (2021).

2021 Leite K, Peixoto MA, Barreto C, Feio R, Dergam J. Cytogenetics of Four Species of The Green Clade *Aplastodiscus* Lutz, 1950 (Anura: Cophomantinae): New Insights into the Chromosomal Evolution of the Genus. Cytogenetics and Genome Research.

2021 Peixoto MA, Evangelista J, Coelho I, Alves R, Laviola B, Fonseca-e-Silva F, Resende M, Bhering L. Multiple-Trait Model Through Bayesian Inference Applied to Jatropha Curcas Breeding for Bioenergy. Plos One.

2021 Silva L. Peixoto MA, Peixoto L. Romero J, Bhering L, Multi-Trait Genomic Selection Indexes Applied to Identification of Superior Genotypes. Bragantia .

2021 Peixoto MA, Coelho, I, Evangelista J, Santos S, Alves R, Pinto J, Reis E, Bhering L. Selection of Maize Hybrids: An Approach with Multi-Trait, Multi-Environment, and Ideotype-Design. Crop Breeding and Applied Biotechnology.

2021 Peixoto MA, Malikouski R, Evangelista J, Alves R, Morais A, Barbosa D, Zucoloto M, Bhering L. Multitrait and Multiharvest Analyses for Genetic Assessment and Selection of Tahiti Acid Lime Genotypes Through Bayesian Inference. Scientia Horticulturae.

2021 Coelho I, Peixoto MA, Marçal T, Bernardeli A, Alves R, De-Lima R, Reis E, Bhering L. Accounting for Spatial Trends in Multi-Environment Diallel Analysis in Maize Breeding. Plos One.

2020 Evangelista J. Peixoto MA, Coelho I, Alves R, Laviola B, Fonseca-e-Silva F, Resende M, Silva F, Bhering L. Environmental Stratification and Genotype Recommendation Toward the Soybean ideotype: A Bayesian Approach. Crop Breeding and Applied Biotechnology.

2020 Barreto C, Peixoto MA, Souza K, Travenzoli N, Feio R, Dergam J. Further Insights into Chromosomal Evolution of the Genus *Enyalius* with Karyotype Description of *Enyalius boulengeri* Etheridge, 1969 (Squamata, Leiosauridae). Caryologia.

2020 Peixoto MA, Guedes T, Silva E, Feio R, Romano P. Biogeographic Tools Help to Assess the Effectiveness of Protected Areas for the Conservation of Anurans in the Mantiqueira Mountain Range, Southeastern Brazil. Journal for Nature Conservation.

2020 Peixoto MA, Coelho, IF Evangelista, J S Alves, RS Rocha, JRASC Farias, FJC Carvalho, LP Teodoro, PE Bhering, LL Reaction Norms-Based Approach Applied to Optimizing Recommendations of Cotton Genotypes. Agronomy Journal.

2020 Coelho, IF Peixoto MA, Evangelista, J S Alves, RS Sales, S Resende, MDV Pinto, JF Reis, EF Bhering, LL Multiple-Trait, Random Regression, and Compound Symmetry Models for Analyzing Multi-Environment Trials in Maize Breeding. Plos One.

2020 Peixoto MA, Alves R, Coelho I, Evangelista J, Resende M, Carvalho J, Fonseca-e-Silva F, Laviola B, Bhering L. Random Regression for Modeling Yield Genetic Trajectories in Jatropha Curcas Breeding. Plos One.

Teaching and talks

Fall 2023 Teaching assistant of Molecular markers applied to plant breeding, graduate level, University of Florida

Summer 2023 Short course in 'Multi-Omic integration for AI Genomic Prediction Breeding'. University of Florida.

Fall 2022 Teaching assistant of Quantitative genetics, graduate level, University of Florida

Spring 2021 Guest lecture "Artificial intelligence in the big data era: insights and applications", Federal University of Juiz de Fora

Fall 2020 Guest lecture "Forest genetics: present and perspectives", Sistemas integrados Florestais, Brazil

Fall 2020 Short course in Spatial statistics applied to plant breeding, Federal University of Viçosa

Fall 2020 Short course in mixed models applied to plant breeding, Federal University of Vicosa, Brazil

Spring 2020 Short course in experimental statistics applied to plant breeding, CMPC company, Brazil

Spring 2020 Short course in mixed models applied to plant breeding, Sistemas integrados Florestais, Brazil

Spring 2020 Teaching assistant of experimental statistics, graduate level, Federal University of Viçosa

Specialized Training

2022 Breeding Programme Modelling with AlphaSimR, Roslin Institute

2021 BLUPf90 workshop, University of Florida

2021 Modeling G×E interaction using genomic, phenotypic, and environmental data, University of Goias

2020 High-throughput phenotyping, ESALQ, São Paulo University

2020 Genotype-by-Environment interaction in genomic selection, Federal University of Viçosa

2019 Introduction to Python language, GDMA, Federal University of Viçosa

References

Dr. Leonardo Lopes Bhering
Professor at Federal University of Viçosa
leobhering@gmail.com
+ 55 (31) 987826227

Dr. Márcio F. R. Resende
Professor at University of Florida
mresende@ufl.edu
+ 1 (352) 682 0488