

# CV: Gabriel Rodrigues Palma, July 2024

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## Contact Details

Hamilton Institute, Maynooth University, Maynooth, Co. Kildare  
E-mail: gabriel.palma.2022@mumail.ie

## Education

2021-pres.: PhD in Data Science, Maynooth University, Ireland.  
2017-2021: BEd in Biology, University of São Paulo, Brazil.  
2017-2021: BSc in Biology, University of São Paulo, Brazil.

## Employment history

### Internships

2022: Data Science Intern, *Ericsson, Athlone, Ireland, June - August.*  
2022: Data analyst research collaborator, *NIBIO Norwegian Institute of Bioeconomy Research, Ås, Norway, 2 weeks in October.*  
2024: Machine learning and vision research collaborator, *University of Leon, Leon, Spain, 2 weeks in April.*

### Contracts

2022-2023: Lecturer for the module ST203 R for Statistics and Data Science, *Maynooth University, Maynooth, Ireland, September - January.*

## Grants Awarded

### Personal

- Statistical Modelling and machine learning applied to automating animal monitoring systems, *Science Foundation Ireland, Grant number 18/CRT/6049*, In progress.
- Predicting pest outbreaks: comparing machine learning methods and alert zone procedure, *Scientific Initiation, FAPESP proc. no. 20/06147-7*, Duration: 12 months (Nov/2020 – October/2021).
- Detecting pest outbreaks based on time-series data, *Scholarship program for international exchange, University of São Paulo Agency for innovation*, Duration: 3 months (Dec/2019 – Mar/2020).
- Alert zone implementation on pest monitoring in agricultural landscapes, *Scientific Initiation, FAPESP proc. no. 19/14805-7*, Duration: 5 months (Aug/2019 – Dec/2019; Mar/2020).
- Mathematical models applied to symbiont-insect-host systems (Sub project 1 - Oct/2017 – Aug/2018), Spatial dynamics of symbiont-host-parasitoid in agricultural landscapes (Sub project 2 - Oct/2018 – Mar/2019) , *Scientific Initiation, FAPESP proc. no. 17/19984-1*, Duration: 18 months.

### Supervision of undergraduate projects

- Caio Lopes Souza, Title: Stock price prediction: a machine learning approach, *Unified Scholarship Program of the University of São Paulo/Brazil*, Duration: 12 months. Status: In progress.
- Caio Lopes Souza, Title: Cryptocurrency price prediction models with machine learning and time series reconstruction, *Unified Scholarship Program of the University of São Paulo/Brazil*, Duration: 12 months. Status: Under evaluation.

## Awards

2020: Honorable Mention Award for the work entitled "A new asymptotic confidence interval for Shannon's index and comparison with bootstrap percentile interval", University of São Paulo International Symposium of Undergraduate Research (First phase), São Paulo, Brazil.  
2019: Honorable Mention Award for the work entitled "Kernel density estimation for Tsallis entropy", University of São Paulo International Symposium of Undergraduate Research (Second phase), São Paulo, Brazil.  
2019: Honorable Mention Award for the work entitled "Kernel density estimation for Tsallis entropy", University of São Paulo International Symposium of Undergraduate Research (First phase), São Paulo, Brazil.  
2018: Honorable Mention Award for the work entitled "Bootstrap confidence interval for the Tsallis entropy", University of São Paulo International Symposium of Undergraduate Research (First phase), São Paulo, Brazil.

## Teaching Experience

### Contract Lecturer

2022 ST203 R for Statistics and Data Science, *Maynooth University, Maynooth, Ireland, September - January.*

### Short courses and invited lectures

- 2024 Short course on Applications of Deep Learning and Machine Vision, *University of São Paulo, Piracicaba, Brazil, 4h.*
- 2024 Short course on Data visualisation, *Institute Curie and Institute Pasteur, Paris, France. 25th of April, 3h30m.*
- 2024 Short course on Linear modelling, *Institute Curie and Institute Pasteur, Paris, France. 25th of April, 3h30m.*
- 2024 Invited Lecture on Topics in Data Analytics, *Maynooth University, Maynooth, Ireland, taught by Prof. Rafael A. Moral. 27th of February, 2h.*
- 2023 Invited Lecture on Topics in Data Analytics, *Maynooth University, Maynooth, Ireland, taught by Prof. Rafael A. Moral. 27th of February, 2h.*
- 2023 Invited Lecture on Introduction to statistics, *Maynooth University, Maynooth, Ireland, taught by Prof. Rafael A. Moral. 24th of October, 1h.*

### Teaching Assistance

- 2022 Topics in Data Analytics, *Maynooth University, Maynooth, Ireland, taught by Prof. Rafael A. Moral, 27th of February to 24th of May, 10h.*
- 2019 Statistical Machine Learning, *University of São Paulo, Piracicaba, Brazil, taught by Prof. Rafael A. Moral for MSc and PhD students of the Statistics programme, 5–27 of August, 60h.*
- 2018 Introduction to R and R markdown: Theory and statistical applications, *University of São Paulo, Piracicaba, Brazil, taught by Prof. Cristian Villegas-Lobos, August, 4h.*

### Other Teaching Experience

- 2023 Voluntary combinatorics teacher for mathematics olympiad students, *Maynooth University, Ireland, February.*
- 2022 Voluntary combinatorics teacher for mathematics olympiad students, *Maynooth University, Ireland, January.*
- 2017 Voluntary Biology teacher, non-governmental organisation called *Ong Fênix*, Brazil, October.

## Software development

- Lead author of the Python package *bepr* (<https://pypi.org/packages/bepr>) published on pypi (Python Package Index).
- Lead author of the Python package *pypbp* (<https://pypi.org/packages/pypbp>) published on pypi (Python Package Index).
- Lead author of the software system Entomology Practical Learning System. Available in: <http://taxustec.com.br/apps/siape>.
- Lead author of the software system Entomological Identification System. Available in: <http://taxustec.com.br/apps/sient/>.

## Peer-reviewed publications

### Journal publications

- Araripe, P.P., Lara, I.A.R., **Palma, G.R.**, Cahill, N., Moral, R. A. (2024) Diagnostics for categorical response models based on quantile residuals and distance measures. *Journal of Applied Statistics*. <https://doi.org/10.1080/02664763.2024.2367150>.
- **Palma, G.R.**, Godoy, W. A., Engel, E., Lau, D., Galvan, E., Mason, O., Markham, C., Moral, R. A. (2023) Pattern-based prediction of population outbreaks. *Ecological Informatics*, 77, 102220.
- Moral, R.A., Chen, Z., Zhang, S., McClean, S., **Palma, G.R.**, Allan, B., Kegel, I. (2022) Profiling Television Watching Behaviour Using Bayesian Hierarchical Joint Models for Time-to-Event and Count Data. *IEEE Access*, 10, p. 113018–113027.

- Rios, R., Nogueira, T., **Palma, G.R.**, Mello, R. Brazilian forest dataset: A new dataset to model local biodiversity. *Journal of Experimental & Theoretical Artificial Intelligence* (2021) doi:10.1080/0952813X.2021.1871972.

#### Book chapter

- **Palma, G.R.**, Hackett, C.P., Markham, C. (2024) Machine Vision Applied to Entomology. In: A. Moral, R., Godoy, W.A. (eds) *Modelling Insect Populations in Agricultural Landscapes*. Entomology in Focus, vol 8. Springer, Cham. [https://doi.org/10.1007/978-3-031-43098-5\\_9](https://doi.org/10.1007/978-3-031-43098-5_9).

#### Journal publications under review

- Rakes, M., Morais, M. C., Ribeiro, L. D. P., **Palma, G. R.**, Moral, R. D. A., Bernardi, D., Grützmacher, A. D. (2024) The temperature affects the impact levels of synthetic insecticides on a parasitoid wasp used in the biological control of pentatomid pests in soybean crops. arXiv preprint arXiv:2403.05479.
- Bueno, I., **Palma, G. R.**, Lara, I. A., Moral, R. A., Delalibera Jr, I., Godoy, W. A. (2024) Understanding Social Immunity in Ants: A Markovian Approach to Collective Cleaning Strategies. arXiv preprint arXiv:2402.05924.
- **Palma, G. R.**, Mello, R. F., Godoy, W. A., Engel, E., Lau, D., Markham, C., Moral, R. A. (2023) Forecasting insect abundance using time series embedding and machine learning. arXiv preprint arXiv:2312.16196.
- **Palma, G. R.**, Thornberry, C., Commins, S., Moral, R. D. A. (2023) Understanding learning from EEG data: Combining machine learning and feature engineering based on hidden Markov models and mixed models. arXiv preprint arXiv:2311.08113.
- de Lara, I. A. R., **Palma, G. R.**, Bon, V. J., Reigada, C., Moral, R. D. A. (2023) Multi-state models for double transitions associated with parasitism in biological control. arXiv preprint arXiv:2310.20312.
- **Palma, G. R.**, Coutinho, R. M., Godoy, W. A., Cônsoli, F. L., Kraenkel, R. A. (2022) Bacteriophage effect on parasitism resistance. arXiv preprint arXiv:2205.03382.
- **Palma, G. R.**, Zocchi, S. S., Godoy, W. A., Wiendl, J. A. (2022) New confidence interval methods for Shannon index. arXiv preprint arXiv:2204.10073.

#### Selected conference proceedings

- Alves, J. C. R., **Palma, G. R.**, Freitas, S. M., Lara, I.A.L. (2024) Beta regression mixed model applied to sensory analysis. 68th annual meeting of the Brazilian Region of the International Biometric Society, Piracicaba, Brazil.
- Bueno, I., **Palma, G. R.**, Lara, I. A., Moral, R. A., Delalibera Jr, I., Godoy, W. A. (2024) "Markovian Modeling of Ant hygiene behaviour." 68th annual meeting of the Brazilian Region of the International Biometric Society, Piracicaba, Brazil.
- **Palma, G. R.**, Skoczeń, M., and Maguire, P. (2024) Predicting traders' decisions using machine learning in well-established and emerging markets. 68th annual meeting of the Brazilian Region of the International Biometric Society, Piracicaba, Brazil.
- Souza, C. L., Zocchi, S. S., **Palma, G. R.** (2024) Stock price prediction: a machine learning approach. 68th annual meeting of the Brazilian Region of the International Biometric Society. Piracicaba, Brazil.
- **Palma, G. R.**, Skoczeń, M., and Maguire, P. (2024) Predicting traders' decisions using machine learning and explainable AI. 44th Conference on Applied Statistics in Ireland. Athlone, Ireland.
- **Palma, G.R.**, Mello, F., Godoy, W. A., Engel, E., Lau, D., Moral, R.A. (2023) Forecasting the abundance of agricultural pests: a new machine learning framework. 9th Channel Network Conference, Wageningen, Netherlands.
- Santos, J.R.; Takahashi, T.A.; Garcia, A.G.; **Palma, G.R.**; Moral, R.A.; Parra, J.R.P. (2023) O alimento do hospedeiro Spodoptera frugiperda (J.E. Smith) (Noctuidae) interfere no parasitismo de Aleiodes sp. n. Wesmael (Braconidae)? 17th Brazilian Symposium of Biological Control, Bahia, Brazil,
- Santos, J.R.; Takahashi, T.A.; Garcia, A.G.; **Palma, G.R.**; Moral, R.A.; Parra, J.R.P. (2023) Impacto do ínstar do hospedeiro no parasitismo de Aleiodes sp. n. Wesmael (Hymenoptera: Braconidae) em Spodoptera spp. Guenée (Lepidoptera: Noctuidae). 17th Brazilian Symposium of Biological Control, Bahia, Brazil,
- **Palma, G.R.**, Mello, F., Godoy, W. A., Engel, E., Lau, D., Moral, R.A. (2023) Forecasting insect abundance using time series embedding and environmental covariates. 37th International Workshop on Statistical Modelling, Dortmund, Germany.
- Lara, I.A.L., **Palma, G.R.**, Bon, V., Reigada, C., Moral, R.A. (2023) Multi-state models for double transitions associated with parasitism in biological control. 37th International Workshop on Statistical Modelling, Dortmund, Germany.

- **Palma, G.R.**, Mello, F., Godoy, W. A., Engel, E., Lau, D., Moral, R.A. (2023) A New Forecasting Tool Based on Time Series Embedding. 43rd Conference on Applied Statistics in Ireland, Killarney, Ireland.
- Souza, C. L., **Palma, G. R.**, Zocchi, S. S., (2023) Petrobras S.A. stock price change prediction using machine learning. 30th International Symposium of Scientific Initiation of the University of São Paulo. Piracicaba, Brazil.
- **Palma, G.R.**, Aquino, A., Monticelli, P., Verdade, L., Markham, C., Moral, R.A. (2022) A machine vision system for avian song classification with CNN's. Proceedings of the 24th Irish Machine Vision and Image Processing Conference, Belfast.
- **Palma, G.R.**, Aquino, A., Monticelli, P., Verdade, L., Markham, C., Moral, R.A. (2022) From Sound To Images: Bird Species Classification Using CNNs. 43rd Conference on Applied Statistics in Ireland. Cork, Ireland.
- **Palma, G. R.**, Zocchi, S. S., (2020) A new asymptotic confidence interval for Shannon index and comparison with bootstrap percentile interval. 28th International Symposium of Scientific Initiation of the University of São Paulo. Piracicaba, Brazil.
- **Palma, G.R.**, Markham, C., Moral, R.A. (2020) Detecting predation interaction using pretrained CNNs. Proceedings of the 22th Irish Machine Vision and Image Processing Conference, Sligo, Ireland.
- **Palma, G.R.**, Mello, F., Rodrigo, (2019) Artificial Neural Networks: Applications in biology. Proceedings of the XII Symposium of Graduate Students at CENA/USP, Piracicaba, Brazil.
- **Palma, G. R.**, Zocchi, S. S., (2019) Kernel density estimation for Tsallis entropy. 27th International Symposium of Scientific Initiation of the University of São Paulo. Piracicaba, Brazil.
- **Palma, G.R.**, Mello, F., Rodrigo, (2018) Modelos matemáticos aplicados a sistema Hospedeiro-Inseto-Simbionte. Proceedings of the XII Symposium of Graduate Students at CENA/USP, Piracicaba, Brazil.
- **Palma, G. R.**, Zocchi, S. S., (2018) Bootstrap confidence interval for the Tsallis entropy. 26th International Symposium of Scientific Initiation of the University of São Paulo. Piracicaba, Brazil.
- **Palma, G. R.**, Zocchi, S. S., (2017). The comparison of nematode diversity: Before and after soybean planting. 25th International Symposium of Scientific Initiation of the University of São Paulo. Piracicaba, Brazil.

## Link to My citations (Google Scholar)

<https://scholar.google.com/citations?user=CF-hbikAAAAJ&hl=pt-BR>

## Selected professional services

### International committees

2023-pres.: Student Representative of the Executive Committee of the British and Irish region of the International Biometric Society.

### National committees

2022-2023 Member of the Executive Committee of the Young Statisticians' Section of the Irish Statistical Association.  
 2023-2024: Website Manager of the Executive Committee of the Young Statisticians' Section of the Irish Statistical Association.  
 2024-pres.: Vice-Chair of the Executive Committee of the Young Statisticians' Section of the Irish Statistical Association.

### Regional committees

2022-2023: Member of the Hamilton institute student seminar committee at Maynooth University.