Rafael Menezes

Ecology Ph.D. Candidate, Physics M.Sc.

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University of São Paulo, Brazil

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Links

www.rafaelmenezes.com

ORCID

Research Gate

@r-menezes (Github)

Google Scholar

Skills

Movement Ecology

Community Ecology

Complex Networks Theory

Deterministic/Stochastic Modeling

Statistical Modeling

Individual Based Modeling

Spatial Pattern Analysis

Monte Carlo Simulation

Python, R, C++

Summary

I am an ecology Ph.D. Candidate with a physics formation. In my PhD I contribute to bridging the gap between Movement and Population Ecology by exploring the population and community-wide consequences of organism movement.

Education

2023 – present **Exchange Program** Center for Advanced Systems Understanding (CASUS), Germany
Advisor: *Prof. Dr. Justin Calabrese*
Co-Advisor: *Prof. Dr. Ricardo Martínez-García*

2021 – present **PhD in Ecology** São Paulo University (USP), Brazil
Advisor: *Prof. Dr. Ricardo Martínez-García*
Co-Advisor: *Prof. Dr. Paulo Inácio Prado*

2017 – 2020 **Master of Science in Physics** Federal University of Bahia (UFBA), Brazil
Advisor: *Profa. Dra. Suani Pinho*
Co-Advisors: *Profa. Dra. Flora Bacelar*, *Prof. Dr. Pedro Meirelles*

Master Thesis
Exploring Ecological Interactions Using the Generalized Lotka-Volterra Model: Coexistence and Resilience of Populations, defended in December 15th, 2020

2012 – 2017 **Bachelor of Science in Physics** Federal University of Bahia (UFBA), Brazil
Study abroad: 2014 – 2015 at Radboud University, Nijmegen NL, Funded by a CAPES Science Without Borders Grant

Publications

2024[1] **Encounters and interactions in ecology. [Review]**
Fagan, W., Menezes, R., Martinez-Garcia, R., ...*
in preparation

2024[1] **Viral infections dynamics rule zooxanthellae population dynamics.**
Campos, A., Menezes*, R., Bacelar, F., Meirelles, P.*
in preparation

2024[1] **Upscaling the consequences of movement to population dynamics: insights from logistic equations with range-resident movement.**
Menezes, R., Calabrese, J., Fagan, W., , Prado, P. I., Martinez-Garcia, R.
in preparation

2024[1] **Testing the limits of population abundance and fluctuations**
Cammarota, D., Zeraick Monteiro, N., Menezes, R., ...Segura, A. M.
American Naturalist (in review)

2024[1] **CPR, the hidden keystones structuring microbial communities.**
Ferreira, C.M., Campos, A., Menezes, R., ..., Meirelles, P.M.
Science of the Total Environment (in review)

2023 **Lotka-Volterra model with Allee effect: Equilibria, coexistence and size scaling of maximum and minimum abundance.**
Cammarota, D., Zeraick Monteiro*, N., Menezes*, R., ..., Segura, A. M.*
Journal of Mathematical Biology, 87, 82.

2020 **Integrating Computational Methods to Investigate the Macroecology of Microbiomes.**
Mascarenhas, R., Ruziska, F. ... dos Santos, R. M., ..., Meirelles, P.M.
Frontiers in Genetics, 10, 1344.

2019 **In response to "An allometric tragedy of the commons: Response to the article 'Evaluation of models capacity to predict size spectra parameters in ecosystems under stress'".**
dos Santos, R. M., Hilbers, J. P., Hendriks, A. J.
Ecological Indicators, 96, 747-749.

2017 **Evaluation of models capacity to predict size spectra parameters in ecosystems under stress.**
dos Santos, R. M., Hilbers, J. P., Hendriks, A. J.
Ecological Indicators, 79, 114-121.

* Equal Contribution

Scholarships and Awards

2023 – present	**CAPES Internationalization Scholarship** Scholarship Grant funded by CAPES (12 months)	CAPES
2021 – present	**CNPq Ph.D. Scholarship Grant** Ph.D. Scholarship Grant funded by CNPq (48 months)	CNPq
2017 – 2019	**CAPES M.Sc. Scholarship Grant** M.Sc. Scholarship Grant funded by CAPES (24 months)	CAPES
2017	**Honorable Mention at the UFBA 2017 Congress** Honorable Mention received during the XXXVI Student Research Seminar for the project "Dynamical models of vectorial-borne diseases" conducted under supervision of profa. Dra. Suani Pinho	UFBA
2016 – 2017	**Dynamical Models of Vector-borne Diseases** B.Sc. Research Scholarship Grant funded by FAPESB (12 months)	FAPESB
2014 – 2015	**Exchange Student – Radboud University, Nijmegen** Science Without Borders Exchange Program Grant (12 months)	CAPES
2012 – 2013	**Galilean Relativity: Inertial and Non-Inertial Systems** B.Sc. Research Scholarship Grant funded by CNPq through the program "Young Talents for Science" (12 months)	CNPq
2010	**Silver Medal at the Brazilian Physics Olympiad** Awarded by the State Coordination of the Brazilian Physics Olympics	SBF - BA

Invited Talks

2024	**Applied Stochastic Processes for Encounter Problems University of Maryland** Upscaling range residency: The range-resident logistic model.	Maryland, USA
2023	**Modeling Coffee Swansea University** The scaling of individual home ranges and spatial structure and their effects on the carrying capacity of populations.	Swansea, UK
2023	**Eco-Encontros University of São Paulo** Não tão bem misturado: O papel das áreas vitais na capacidade de suporte	São Paulo, Brazil
2022	**ICTP Huddle - Eco-evolutionary Dynamics of Microbial Communities Across Scales** Not so well mixed: the role of range residency in the dynamics of ecological communities	Trieste, Italy

Contributed Talks & Posters

2023	**Spatial Ecology Workshop: From animal movement processes to spatial distributions, University of Sheffield, UK** Adding realistic movement behavior to spatial models of population growth	Workshop
2022	**Applications of Nonlinear Systems to Socio-Economic Complexity** What Is and How do Interactions Determine Resilience?	School
2021	**Brazilian Physics Society Autumn Meeting** Exploring Ecological Interactions Using the Generalized Lotka-Volterra Model	Conference
2021	**SMB 2021 Annual Meeting, Society for Mathematical Biology** Feasibility and Resilience in Randomly Assembled Communities	Conference
2020	**School of Community Ecology: from principles to patterns** Community Interactions: Integrating dynamical systems and network science	Student talk
2017	**Congress of Research, Teaching and Outreaching at UFBA** Understanding Epidemics Through Mathematical Modeling: Zika, Dengue and Leishmaniasis	Congress
2017	**I Scientific Meeting on Modeling in Ecology and Evolution (ECMEE), Brazil** Mathematical Modeling of Leishmaniasis: Control Through Collar with Insecticide	Meeting
2017	**II National Meeting of Statistical Physics (ENFE), Brazil** Mathematical Modeling of Leishmaniasis: Control Strategies	Conference
2015	**Europhysics Conference of International Research Group on Physics Teaching** Understanding Entropy: translating the technical into the intuitive	Conference

Tutoring & Event Organization

2023	**IX Southern Summer School of Mathematical Biology** Organizers: ICTP Saifr, Serrapilheira Institute.	Tutor
2022	**II Encontro da Pós Graduação IB-USP** Scientific with the participation of approx. 90 people, at University of São Paulo	Organizer
2022	**Escola de Biomatemática da Bahia** Organizers: Flora Souza Bacelar, Roberto Kraenkel, Paulo Inácio Prado, Gilson Correia de Carvalho	Tutor
2019 - 2020	**VIII - IX Southern Summer School of Mathematical Biology** Organizers: Marcus Aguiar, Marcel Clerc, Roberto Kraenkel, Paulo Inácio Prado	Tutor