

BRUNO DO ROSARIO PETRUCCI

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243 Bessey Hall, Iowa State University
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EDUCATION

Iowa State University

PhD in Ecology and Evolutionary Biology

Advisor: Tracy A. Heath

Expected May 2025

University of Chicago

B.S. in Computational and Applied Mathematics with Honors

GPA: 3.87/4.00

Magna Cum Laude (2020), Dean's List (2017-2020)

June 2020

RESEARCH

University of Chicago Department of Geophysical Sciences

March 2019 - June 2020

Research Assistant, Principal Investigator: Michael Foote

Chicago, IL

- Developed PaleoBuddy, an R package to accurately simulate general birth-death processes, the first package to allow for time-varying age-dependency rates in diversification
- Extensively tested the package on datasets of tens of thousands of simulations, both against analytically solvable and simulated scenarios
- Wrote an Honors Thesis for the CAM major on the development and advancements of PaleoBuddy in the context of paleobiology

University of Sao Paulo Department of Ecology

July 2019 - September 2019

Research Assistant, Principal Investigator: Tiago Quental

Sao Paulo, SP, Brazil

- Used R simulations to test PyRate, a widely used software to estimate diversity dynamics in deep time, on its robustness to the resolution of the fossil record
- Started development of PaleoBuddy, continuing to collaborate with Prof. Quental and his student Matheus Sousa throughout the duration of the project

University of Chicago Department of Ecology & Evolution

June 2018 - September 2019

Research Assistant, Principal Investigator: Greg Dwyer

Chicago, IL

- Built differential and difference equation models in Python and R to predict dynamics of gypsy moth populations under virus spraying biological control
- Wrote a scientific publication about the need for caution in the biological control of gypsy moths found from simulation results, currently in preparation

University of Chicago Kavli Institute for Cosmological Physics

November 2017 - June 2018

Research Assistant, Principal Investigator: Luca Grandi

Chicago, IL

- Wrote simulations on the Geant4 C++ toolkit for both geometry and particle collisions for the RELAX dark matter detector, a detector for parameter estimating in dark matter physics
- Helped in the planning of detector characteristics and expected results from simulations
- Assisted in the building of the detector itself, mostly with soldering and electronics

TEACHING

Introduction to Quantitative Modeling in Biology (Basic)

March 2019 - June 2019

Teaching Assistant - 10h/week

Chicago, IL

- Taught weekly lab sessions for 15 students on R programming as well as methods for analysis of biological data in R

Elementary Functions and Calculus I-II

September 2018 - March 2019

Junior Tutor - 15h/week

Chicago, IL

- Taught 10 students in weekly mandatory supplementary sections on the broader implications of the results covered in class, besides introducing advanced concepts to interested students

Calculus I

September 2017 - December 2017

Teaching Assistant - 10h/week

Chicago, IL

- Held weekly office hours open to all students in the class (60), and graded homework

Mathematical Methods for the Physical Sciences I

March 2017 - June 2017

Grader - 10h/week

Chicago, IL

- Graded weekly homework for the 30-student class

Colegio Vital Brazil - Physics, Chemistry and Biology

September 2015 - December 2015

Intern - 35h/week

Sao Paulo, SP, Brazil

- Aided with the preparation and execution of weekly science lectures and labs; held biweekly presentations to expand on important physics and mathematics concepts for university entry exams
- Created an organizational system for easy access to the tools and equipment for the physics laboratory that the school still uses

AWARDS & HONORS

EEB Fellowship

2020-2021

- Fellowship (\$9600/semester) awarded to the highest ranked applicant in ISU's EEB program every year

LAS Graduate Scholar Award

2020-2021

- Award (\$3000) awarded to competitive applicants in ISU's LAS programs every year

College Research Fellows Program

January 2020 - June 2020

- Salary (\$15/hour) awarded my work with Michael Foote during the 2020-2021 academic year

Jeff Metcalf Global Fellowship Grant

June 2019

- Fellowship (\$5000) awarded for my work with Tiago Quental in the Summer of 2019

College Research Fellows Program

September 2018 - June 2019

- Salary (\$12/hour) awarded for my work with Greg Dwyer during the 2018-2019 academic year

UCISTEM Summer Research Grant

June 2018

- Grant (\$1000) awarded for my work with Greg Dwyer during the Summer of 2018

PRESENTATIONS

PaleoBuddy: Simulating evolutionary dynamics in R, National Collegiate Research Conference (2020).
University of Chicago Geophysical Sciences department (2020).

PaleoBuddy: An R Package for simulation of fossil records and phylogenies with variable rates and age dependency, Paleontology Club at the University of Chicago (2019), Invited to talk.

LEADERSHIP

University of Chicago Animal Welfare Society September 2016 - Present
President (2019), Events Chair (2018), Social Media Chair (2017) Chicago, IL

- Created staple events for the organization, such as an annual trip to an Illinois animal sanctuary, quarterly volunteering at the local public shelter, and biweekly animal rights presentations
- Managed events with attendance over 150 people and funds over \$3000 two years in a row

SKILLS

R, Advanced

Stochastic simulations
Package publication
Pedagogical tools

Python, Advanced

Numpy, Pandas
Matplotlib and similar

Scikit-learn (in progress)

Numerical ODEs

Other

Shell

SQL (in progress)

C, Intermediate

C++, Elementary

Coursework

Functional programming
Algorithms and complexity
Systems

Languages

Portuguese (Native)
English (Fluent)