BRUNO DO ROSARIO PETRUCCI

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EDUCATION

Iowa State University *Expected May 2025*
PhD in Ecology and Evolutionary Biology
GPA: 4.00/4.00
Advisor: Tracy A. Heath

University of Chicago *June 2020*
B.S. in Computational and Applied Mathematics with Honors
GPA: 3.87/4.00
Magna Cum Laude (2020), Dean's List (2017-2020)

RESEARCH

Iowa State University Department of Ecology, Evolution, and Organismal Biology June 2020 - Present
PhD Student/Research Assistant, Advisor: Tracy A. Heath *Ames, IA*

- Developed on RevBayes, a team managed software for Bayesian analysis of phylogenetic trees and fossil records, fixing persistent bugs on the program
- Implemented novel diversification scenarios for simulation, and assessed the power of quantitative inference methods on detecting this signal

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 accuraterly 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 graduate 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

PUBLICATIONS AND PRESENTATIONS

do Rosario Petrucci, B., Carran, S., Dwyer, G. "Integrating Biological Control in Eco-Evolutionary Gypsy Moth Models," under preparation.

do Rosario Petrucci, B., Januario, M., Quental, T. B. "paleobuddy: An R package for flexible simulations of species diversification and sampling," under preparation.

paleobuddy: an R package for flexible and robust simulation of diversification dynamics, 28th Annual EEB Symposium (2021).

PaleoBuddy: Simulating evolutionary dynamics in R, National Collegiate Research Conference (2020); University of Chicago Physical Sciences Division Undergraduate Research Symposium (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 - June 2020
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)