Daniel Rhoda

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Education & Employment

2020 – present Ph.D. in Evolutionary Biology, University of Chicago
M.S. in Evolutionary Biology, University of Chicago (earned April 2022)
2016 – 2020 B.S. in Biology, Indiana University

Technical Skills

R (including shiny & tidyverse), Mathematica, Python, Bash, MySQL, PHP, Adobe & Microsoft Office Suite

Academic Research Experience

University of Chicago, Graduate Researcher | August 2020 – Present

Ongoing projects

- Analyze phenotypic data in R using multivariate statistical techniques such as PCA, generalized and partial least-squares regressions, trend surface analyses, and MANOVA to understand evolutionary processes while accounting for the potential non-independence of observations due to evolutionary relatedness
- Build R Shiny application to interactively visualize any theoretical mollusk shell shape from only four simple parameters (Raup's shell coiling equations)
- Lead independent study employing eigenanalysis of phenotypic covariance matrices, accounting for rank-deficiency and in a phylogenetic context, to demonstrate that anisotropic variation at the species-level confers a macroevolutionary constraint in the skulls of mammals

Past projects

- Developed a novel Procrustes superimposition algorithm (in R & Mathematica) allowing researchers to analyze complex articulated anatomical structures simultaneously with geometric morphometrics
- Authored simulation study published in *Integrative & Comparative Biology* (by invitation) to evaluate the above method's utility and employed the method to lead a collaborative, empirical study on the morphological diversity and evolutionary modularity of snake jaws, published in *Evolution*

Indiana University, Undergraduate Researcher | August 2016 – May 2020

- Micro-CT scanned ~200 fossil brachiopods and ran computational fluid dynamic (CFD) simulations in OpenFOAM to identify form-function relationships, resulting in novel findings that were presented in the 'Future Leaders of Paleontology' prize session at the Geological Society of America's annual meeting
- Wrote custom Bash script that automated CFD trials, and leveraged morphometric data to ensure that all specimens were in a standardized orientation (an otherwise time-consuming step)
- Presented original research 9 times at professional conferences (6 oral, 3 poster) between 2017-2021

Grants and Awards ($150,200 awarded in total)

2020-2025 National Science Foundation (NSF) Graduate Research Fellowship ($138,000)
2020 Executive Dean's Award for Undergraduate Research and Creative Activity, Indiana University
2019 NSF Research Internship at the American Museum of Natural History, New York ($6,500)
2018-2020 Eight additional merit-based awards totaling $6300