

# BEN TEO

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## EDUCATION

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**University of Wisconsin-Madison**

Aug 2018 – Fall 2024

Ph.D. Dissertator in Statistics

**Carnegie Mellon University**

Aug 2013 – May 2017

B.S. Mathematics (Additional Minor in Computer Science)

## RESEARCH INTERESTS

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Statistical and computational techniques for scalable inference of trait models on phylogenetic networks.

## PUBLICATIONS

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**Teo, B.**, Bastide, P., Ané, C. 2024. Leveraging graphical model techniques to study evolution on phylogenetic networks. *arXiv preprint*. <https://doi.org/10.48550/arXiv.2405.09327>.

**Teo, B.**, Rose, J. P., Bastide, P., and Ané, C. 2023. Accounting for within-species variation in continuous trait evolution on a phylogenetic network. *Bulletin of the Society of Systematic Biologists*. <https://doi.org/10.18061/bssb.v2i3.8977>.

Tang, S., Lee, T. S., Li, M., Zhang, Y., Xu, Y., Liu, F., **Teo, B.**, and Jiang, H. 2018. Complex pattern selectivity in macaque primary visual cortex revealed by large-scale two-photon imaging. *Current Biology*, 28(1):38–48. <https://doi.org/10.1016/j.cub.2017.11.039>.

## MANUSCRIPTS

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**Teo, B.**, Bacharach, M., Kolb, A., Ané, C., Roch, S., Brandt, C. Capabilities and limitations of explicit network methods for recombinant detection: a case study using Bovine Alpha herpesvirus 1. *In preparation*.

## TALKS

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*Leveraging graphical model techniques to study evolution on phylogenetic networks*. 3rd Joint Congress on Evolutionary Biology. Montreal, Canada. July 2024

*Belief propagation for continuous trait evolution on phylogenetic networks*. UW-Madison SGSA Student Seminar. Madison, WI. Nov 2022

*Accounting for within-species variation in continuous trait evolution on a phylogenetic network*. Evolution conference. Cleveland, OH. June 2022

## SOFTWARE

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Contributor to: [PhyloGaussianBeliefProp.jl](#), [PhyloNetworks.jl](#)

## HONORS AND AWARDS

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SRGC Conference Presentation Award, UW-Madison Graduate School

Summer 2024

Mayr Symposium, Finalist. 3rd Joint Congress on Evolutionary Biology

July 2024

Statistics Poster Competition, 2nd place. CMU Undergraduate Research Symposium

May 2017

## UW ACADEMIC EXPERIENCE

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### Teaching Assistant

Fall 2018 – Fall 2022

Stat 301/324/371: Introductory Applied Statistics for Social Sciences/Life Sciences/Engineers

Stat 349: Time Series, Stat 424: Experimental Design, Stat 479: Bayesian Analysis

Stat 850: Theory/Application of Regression and Analysis of Variance II

### Graduate Student Mentor

Stat 699: Directed Study

Fall 2021

### Research Assistant

Statistics Department

Spring 2023 – Spring 2024

Institute for Foundations of Data Science

Summer 2021

## PAST PROJECTS

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### Sun Prairie Community Schools Data Dashboard

Fall 2021

### Phylogenetic analysis of Algonquian using SNAPP

Spring 2021

### Phylogenetic analysis of Algonquian using BEAST2

Summer 2020

## CMU ACADEMIC EXPERIENCE

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### Project Assistant: Modeling/clustering neuron response to parametrized visual stimuli

Center for Neural Basis of Cognition, Lee Lab

Summer 2017

### Undergraduate Research: Hidden Markov Models to determine neuron population structure

Statistics Department

Summer 2016 – Spring 2017

## WORK EXPERIENCE

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### Research Programmer

CMU, Computational Biology Department, Murphy Lab

Oct 2017 – July 2018

- Developer and Tester for CellOrganizer Project, a software package for learning generative models of cell/organelle shape/distribution from 2D/3D fluorescence micrographs.
- Worked with the OME-XML file format for reading and writing micrograph pixel/meta-data.
- Worked variously on segmentation related tasks for basal bodies and white blood cells.
- Compiled CellOrganizer source code for deployment, and built Docker container to export the compiled executables to other Docker-supported platforms.
- Created Bash tool scripts and XML tool definition files to enable CellOrganizer tools to be accessed through Galaxy Project's GUI.
- Linked CellOrganizer Project's GitLab repositories with Jenkins CI to enable automated testing.

## TECHNICAL SKILLS

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### Programming Languages

Julia, R, Python, MATLAB, C, Bash

### Markup Languages

Markdown, XML, LaTeX

### Software & Tools

Git, Docker, Jenkins CI, Galaxy Project, BEAST2