

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Distance-based Summaries and Modeling of Evolutionary Trees

Tuesday, September 22, 2022
10:20 AM - 11:10 AM [Eastern Time](#)
Zoom

Abstract

Ranked tree shapes are mathematical objects of great importance used to model hierarchical data and evolutionary processes with applications ranging across many fields including evolutionary biology and infectious disease transmission. While Bayesian methods allow exploration of the posterior distribution of trees, assessing uncertainty and summarizing tree distributions remains challenging for these types of structures. Similarly, in many instances, one seeks to summarize samples of trees obtained with different methods, or from different samples and environments, and wishes to assess stability and generalizability of these summaries. Here, we exploit recently proposed distance metrics of unlabeled ranked evolutionary trees and provide an efficient combinatorial optimization algorithm for estimating Fréchet means and variances. We show the applicability of our summary statistics for studying popular tree distributions and for studying the evolution of viruses.

Bio:

Dr. Julia A. Palacios is an Assistant Professor in the departments of Statistics, Biomedical Data Science, and Biology (by courtesy) at Stanford University. Professor Palacios completed her PhD in Statistics at the University of Washington in 2013. She did a joint postdoc at Harvard University and Brown University before joining Stanford. In her research, Professor Palacios seeks to provide statistically rigorous answers to concrete, data-driven questions in population genetics, epidemiology, and comparative genomics, often involving probabilistic modeling of evolutionary forces and the development of computationally tractable methods that are applicable to big data problems. She was recently awarded the Alfred Sloan Fellowship, the Stanford Terman Fellowship and the NSF Career award.

Zoom details can be found at: <https://stt.natsci.msu.edu/stt-colloquium-zoom-info/>

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