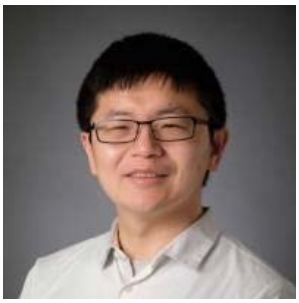
BIOSTATISTICS SEMINAR

Inference for Ranking Problems



Ethan Fang, PhD
Assistant Professor
Department of Biostatistics & Bioinformatics
Duke University

We propose a novel combinatorial inference framework to conduct general uncertainty quantification in ranking problems. We consider the widely adopted Bradley-Terry-Luce (BTL) model, where each item is assigned a positive preference score that determines the Bernoulli distributions of pairwise comparisons' outcomes. Our proposed method aims to infer the general ranking properties of the BTL model. The general ranking properties include the "local" properties such as if an item is preferred over another and the "global" properties such as if an item is among the top K-ranked items. We further generalize our inferential framework to multiple testing problems where we control the false discovery rate (FDR) and apply the method to infer the top-K ranked items. We also derive the information-theoretic lower bound to justify the minimax optimality of the proposed method. We conduct extensive numerical studies using both synthetic and real data sets to back up our theory.

Thursday, February 23, 2023, 3:30-4:30 PM Eastern

133 Rosenau Hall

Virtual using link and info below.

https://unc.zoom.us/j/91249030964?pwd=UXloTWlHajdQbkRqd1d5TnRaMitYdz09

Meeting ID: 912 4903 0964

Passcode: 884852