

ACMS Statistics Seminar

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154 Hurley Hall

3:30 PM – 4:30 PM



Statistical Inference of Ranks

Rank aggregation from pairwise and multiway comparisons has drawn considerable attention in recent years and has a variety of applications, ranging from recommendation systems to sports rankings to social choice. The existing literature on the ranking problem mainly concerns parameter estimation and algorithm implementation. However, there has been little investigation on the statistical inference theory of ranks. In this talk, I will start with a novel inference framework for ranks based on a modified Plackett-Luce model for multiway ranking with only the top choice observed. Then I will present a new methodology to construct simultaneous confidence intervals for the corresponding ranks through a sophisticated maximum pairwise difference statistic based on the MLE. Practically a valid Gaussian multiplier bootstrap procedure is developed to approximate the distribution of the proposed statistic. With the constructed simultaneous confidence intervals, we are able to study various inference problems on ranks such as testing whether an item of interest is among the top-K ranking. Our inference framework for the ranks can be widely applicable in many other ranking problems.

The Department of Applied and Computational
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