

ACMS Statistics Seminar

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154 Hurley Hall

3:30 PM – 4:30 PM



Probabilistic Tensor Decomposition Model for Measuring Complex Dependence Structure in Sparse Dyadic Event Data

For several decades, political scientists have collected data sets of “dyadic events”—i.e., micro-records of the form “country i took action a to county j at time t ”. Such data sets provide an expansive and systematized view of the world that prompts data-driven approaches to the study of international relations. However, using such data requires analysts to reckon with the presence of “complex dependence structures”, which violate the independence assumptions of many methods in the standard statistical toolkit. In this talk, I will discuss a family of Bayesian models for measuring complex dependence structure in dyadic events. These models blend aspects of tensor decomposition, dynamical systems, and discrete admixtures to capture rich multilayer network structure and excitatory temporal dynamics in country-to-country interactions. While inspired by international relations, these models are tailored to the general statistical properties of sparse and high-dimensional discrete data and are widely applicable to problems where such data sets arise.

The Department of Applied and Computational
Mathematics and Statistics

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